PHASE II ENVIRONMENTAL SITE ASSESSMENT

VACANT RETAIL FILLING STATION PROPERTY
14030 STATE ROAD
NORTH ROYALTON, OHIO

SEPTEMBER 2013

PREPARED FOR:
CUYAHOGA COUNTY LAND
REUTILIZATION CORPORATION
323 LAKESIDE AVENUE WEST
SUITE 160
CLEVELAND, OHIO, 44113

Mannik Smith GROUP

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14030 STATE ROAD
NORTH ROYALTON, OHIO

PREPARED BY: _____

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EXECUTIVE SUMMARY

The Mannik & Smith Group, Inc. (MSG) was retained by the Cuyahoga County Land Reutilization Corporation (CCLRC) to complete a Phase II Environmental Site Assessment (ESA) of a vacant retail filling station located at 14030 State Road, in North Royalton, Ohio (the Property). The purpose of this investigation was to obtain information related to the soil and groundwater quality underlying the Property and to potentially identify orphan USTs in the eastern portion of the Property. MSG understands that the CCLRC is working in partnership with the City of North Royalton, which may be interested in acquiring the Property for commercial redevelopment. Field activities including a Ground Penetrating Radar (GPR) survey, the installation of ten soil borings, and the installation of six groundwater monitoring wells were completed at the Property. The Phase II ESA scope of work was based on the findings of a Phase I ESA MSG completed for the CCLRC in April 2013 and Phase II Field Sampling and Analysis Plan (FSAP) prepared for the CCLRC in July 2013.

The Phase I ESA, which was completed in accordance with ASTM1527-05, identified two Recognized Environmental Conditions (RECs) in connection with the Property:

REC-1 The Property has been used as a retail gasoline outlet from approximately the 1960s through 2006. During that period, the Property was occupied by one or more gas stations operating under the brand names of Gulf, Clark and AP. The long history of UST systems on the Property coupled with the unknown status of former UST systems and undetermined nature of petroleum releases at the Property that have apparently impacted soil and groundwater is considered a REC.

REC-2 Records indicate that prior to 1970, the Gulf station operated an automotive repair shop with two garage bays. The historical automotive repair activities conducted at the Gulf station represent an REC in connection with the Property with regard to the use and possible release of petroleum products and/or solvents, and the undefined affects that these may have on soil and groundwater at the Property.

Based on the Phase II ESA field observations and the laboratory analytical results, MSG has made the following conclusions:

1. Three 10,000-gallon underground storage tanks (USTs) remain on the Property near the southwest corner. A GPR and magnetic locator survey was completed in the eastern portion of the Property, which did not identify anomalies indicative of additional USTs being present on the Property.

2. Based on the analytical soil data, no constituents of concern (COCs) were detected in soil above the Bureau of Underground Storage Tank Regulations (BUSTR) action levels or Ohio Voluntary Action Program (VAP) standards, except for the BUSTR soil to drinking water leaching action level and the Ohio VAP leach based soil values for benzene at two locations (MW-01 4-6' and B-07 4-6'). MSG recognizes that the CCLRC is not completing an Ohio VAP-compliant assessment of the Property; however, we compared the analytical results to VAP standards in the absence of a more suitable standard. The results indicate that the benzene concentrations in the soil could leach into and impact the groundwater. The building on the Property is connected to the public water supply and the groundwater at the Property is not used as a drinking water source. The two monitoring wells (MW-05 and MW-06) located downgradient of MW-01 and B-07 did not reveal concentrations of benzene in excess of the laboratory reporting limit. Given this, the benzene impacts appear to be localized near MW-01 and B-07. Additionally, because drinking water is provided to the Property and the surrounding areas by the City of Cleveland Division of Water, the elevated benzene concentrations are not anticipated to present a complete exposure pathway.

3. Based on the monitoring well gauging data, groundwater is flowing in a southern-southeastern direction across the Property. At only one location (MW-01), the benzene concentration exceeded the BUSTR

groundwater ingestion action level and Ohio VAP unrestricted potable use standard. As stated above, the benzene concentrations at monitoring wells MW-05 and MW-06 (downgradient of MW-01) did not detect benzene in excess of the laboratory reporting limit. Therefore, the elevated benzene concentration appears to be relatively isolated and contained within the Property limits. Furthermore, as stated above, the Property does not use groundwater as a drinking water source and drinking water is provided to the Property and the surrounding areas by the City of Cleveland Division of Water. Therefore, the elevated benzene concentration at MW-01 will likely not present a complete exposure pathway.

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1.0 INTRODUCTION

The Mannik & Smith Group, Inc. (MSG) was retained by the Cuyahoga County Land Reutilization Corporation (CCLRC) to complete a Phase II Environmental Site Assessment (ESA) of a vacant retail filling station located at 14030 State Road, in North Royalton, Ohio (the Property). A Property Location Map is presented on Figure 1. The purpose of this investigation was to obtain information related to the soil and groundwater quality underlying the Property and to potentially identify orphan USTs in the eastern portion of the Property.

1.1 Prior Environmental Investigations

MSG completed a Phase I ESA of the Property in April 2013 for the CCLRC. The Phase I ESA, which was completed in accordance with ASTM1527-05, identified two Recognized Environmental Conditions (RECs) in connection with the Property:

REC-1 The Property has been used as a retail gasoline outlet from approximately the 1960s through 2006. During that period, the Property was occupied by one or more gas stations operating under the brand names of Gulf, Clark and AP. The first documented USTs on the Property were associated with the Gulf station and were located near the southeastern corner of the Property and near the center of the Property. Records reviewed do not indicate whether or not these USTs were ever removed from the Property. A Clark station replaced the Gulf station in approximately 1970. During ownership by Clark, three 7,500-gallon gasoline USTs were installed near the center of the Property. Clark also reportedly operated a kerosene UST located east of the retail building and later another kerosene UST was installed west of the retail building. A fire occurred at the Property in 1984 during which the dispenser pumps were destroyed. In 1988, fire department records indicate that the Clark station USTs were closed by removal from the ground and replaced by three 10,000-gallon USTs located near the southwest corner of the Property. A used oil UST was discovered near the center of the Property during dispenser upgrade activities in 1992. It is possible that the used oil UST was the centrally located UST that was reported to exist during the tenure when Gulf operated at the Property. Records indicate that remnant petroleum constituents in groundwater exceeded potable use standards in the 1990s. The long history of UST systems on the Property coupled with the unknown status of former UST systems and undetermined nature of petroleum releases at the Property that have apparently impacted soil and groundwater is considered a REC.

REC-2 Records indicate that prior to 1970, the Gulf station operated an automotive repair shop with two garage bays. Typical features at an automotive repair facility may have included below grade hydraulic lifts and a below grade oil/water separator. The historical automotive repair activities conducted at the Gulf station represent an REC in connection with the Property with regard to the use and possible release of petroleum products and/or solvents, and the undefined affects that these may have on soil and groundwater at the Property.

1.2 Property Description

The Property is developed with one commercial building, a canopy over four fuel dispensers, and a small wooden shed. The Property is predominantly paved with asphalt or concrete except for small landscaped portions. Three 10,000-gallon gasoline USTs are located west of the Property building and four dispenser islands are located north of the building. According to the Bureau of Underground Storage Tank Regulations (BUSTR), these USTs are out of service. The Property building consists of a small retail area, a walk-in cooler, and restrooms.

The current Property building is vacant and has been so since approximately 2006. The building was historically used as a retail filling station. The most recent occupant of the Property was AP Store #1750. Prior to AP the Property was occupied by a Clark filling station from 1970 through the mid-1990s. Prior to 1970, Gulf occupied the Property with an automotive repair shop and retail filling station. The initial development of the Property as a Gulf station was not readily available, although city directories identified the Property address as being residential [redacted] prior to the commercial development in the 1950s.

2.0 METHODOLOGY

This section describes the field activities conducted by MSG field personnel. Field activities including a Ground Penetrating Radar (GPR) survey, the installation of ten soil borings, and the installation of six groundwater monitoring wells, all of which were completed at the Property.

2.1 Ground Penetrating Radar

On June 21, 2013, a GPR survey was performed by BehrGeo Environmental, LLC over the southeastern portion of the Property using a Mala Ramac X3M ground penetrating radar unit with a 500 MHz transducer/receiver antenna over a grid with an approximately five foot line spacing. The effective penetration depth of the GPR signal during this survey appeared to range from approximately three to five-feet below the ground surface over most of the area surveyed. There was no evidence of significant near-surface signal interference within the survey areas. No anomalies that were consistent with what would be produced by a UST were present in the survey area.

In conjunction with the GPR survey, a magnetic locator survey was completed at the Property. The magnetic locator survey was completed over the same area as the GPR survey. The survey was completed using a Schonstedt GA-52Cx Magnetic Locator on an approximately eight-foot to 10-foot line spacing. Traverses with the magnetic locator were completed in a north-south and an east-west direction over the survey area. No magnetic anomalies that were consistent with what would be produced by a UST were identified in the areas of the GPR survey. Magnetic interference was encountered within about five-feet of the existing building. Other than adjacent to the existing building, no other areas of significant signal interference were identified at the Property. Based upon the lack of GPR and magnetic locator anomalies, it does not appear that any USTs remain in the southeast portion of the Property. The GPR report is included in Appendix A.

2.2 Soil Sampling

On July 31, 2013, MSG advanced ten soil borings (MW-01 through MW-06 and B-07 through B-10) using Geoprobe direct push technologies. The boring locations are depicted on Figure 2. Soil borings were installed to a maximum depth of 32-feet below the ground surface (bgs). The drilling contractor collected soil samples continuously from the ground surface to the terminal depth of the borings using four-foot Geoprobe samplers. MSG obtained soil samples from the driller's sampling equipment at a minimum of two-foot intervals. Soil samples were examined, logged, and split, with one portion being placed in clean, glass jars provided by the laboratory and the other being placed in a plastic bag for screening by a geologist using a photoionization detector (PID). PID readings for each sample interval were recorded on individual soil boring logs. Jarred samples were placed in an iced cooler for storage during transport under proper chain-of-custody to the analytical laboratory. Appendix B contains the soil boring logs.

Soil samples were submitted for laboratory analysis based on PID screening results and/or field observations. Selected soil samples were analyzed, in accordance with the FSAP, for one or more of the following parameters: volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260; benzene, toluene, ethylbenzene, total xylenes, and methyl tert-butyl ether (BTEX/MTBE) by USEPA Method 8260; polynuclear aromatic hydrocarbons (PAHs) by USEPA Method 8270; polychlorinated biphenyls (PCBs) by USEPA Method 8082; and/or total petroleum hydrocarbons (TPH) C_6-C_{12}, C_{10}-C_{20}, C_{20}-C_{34} by EPA Method 8015.

After soil sampling activities were completed, the soil borings were either converted into groundwater monitoring wells or they were backfilled with a combination of soil cuttings and bentonite.

2.3 Groundwater Monitoring Well Installation

On July 31, and August 1, 2013, MSG converted six of the soil borings into permanent groundwater monitoring wells designated MW-01 though MW-06. The well locations are depicted on Figure 2. The monitoring wells extend to depths between 27 and 31-feet bgs. Each one-inch diameter monitoring well was installed using a Geoprobe. Well casings consisted of 1-inch polyvinylchloride (PVC) risers flush threaded to 10-foot sections of 0.01 inch slotted PVC screen with a pre-packed sand filter around the well screen. Additional sand was placed in the annular space around the screen and riser section of each well from the bottom of the well to two feet above top of screen and bentonite chips from two feet above the screen interval to one foot bgs. All of the monitoring wells were completed flush with existing grade in concrete. Monitoring well details are included in Appendix B.

2.4 Groundwater Monitoring Well Development and Sampling

The groundwater monitoring wells were developed in accordance with the Ohio EPA's Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring (TGM). Development of each well was completed using disposable bailers. The bailer was lowered into the monitoring well until contact with the water column. Insertion of the bailer forced water into the formation and the removal of the bailer containing groundwater allowed for the release of groundwater from the formation and well annulus (sand pack). Periodically, prior to removal from the monitoring well, a full bailer was removed and then allowed to sink in rapid motions along the entire length of the well intake to eliminate bridges that may have formed adjacent to the well intake. This method enhanced the removal of particulates accumulated at the bottom of the well. A peristaltic pump was also used to purge the wells prior to sampling. The purge water was monitored with a water quality meter to measure the pH, temperature, and specific conductance during development.

Sampling of the wells occurred at a minimum of 24 hours after monitoring well installation. In accordance with the TGM, groundwater sampling was completed using a peristaltic pump to purge and monitor the water quality parameters including pH, temperature, and specific conductance, which were measured with a Hanna meter. The pump was set to purge groundwater at an approximate rate of 150 to 200 milliliters per minute (mL/min). Once the water quality parameters stabilized, the conditions in the monitoring wells were assumed to be representative of actual groundwater conditions, a dedicated disposable bailer was used to obtain a grab groundwater sample from each well. All groundwater samples were placed in labeled laboratory-supplied sample containers and then, placed in an ice chest for preservation in the field. The analytical data including the completed chain of custodies are included in Appendix C. Groundwater samples were submitted for laboratory analysis and analyzed for one or more of the following parameters: VOCs by USEPA Method 8260;BTEX/MTBE by USEPA Method 8260; or PAHs by USEPA Method 8270.

2.5 Groundwater Gradient

Static groundwater levels were measured to the nearest 0.01 feet using a water level indicator at each monitoring well. Depth to groundwater measurements were recorded and used to determine groundwater flow direction. MSG surveyed the relative top of casing well elevations using differential leveling. Relative groundwater surface elevations were determined by calculating the difference between the depth to static groundwater from the top of each well casing. Table 1 summarizes the monitoring well gauging data and relative groundwater elevations. The groundwater gradient is south–southeast and is depicted on Figure 3.

2.6 Geological and Hydrogeological Conditions

The native stratigraphy of the Property encountered during soil boring advancement generally consisted of brown silty clay with varying amounts of sand, gravel, and shale fragments from approximately one foot bgs through 24-feet bgs. Gray, saturated sand was encountered at approximately 24 feet bgs. The depth to groundwater was approximately 24-feet bgs. Soil borings advanced within the former UST cavities encountered approximately eight to 12-feet of sand and gravel fill materials overlying the brown silty clay. Soil boring logs are included in Appendix B.

2.7 Quality Assurance/Quality Control

During the sampling of the soil and groundwater, MSG obtained quality assurance/quality control (QA/QC) samples to ensure the accuracy of the investigation. QA/QC samples included an equipment blank, a field blank, a duplicate sample, and a trip blank. The laboratory results of the QA/QC sampling did not identify potential cross-contamination.

3.0 FINDINGS

3.1 Comparative Standards

Although the Property has USTs on-site, this assessment was not conducted as part of corrective actions within the BUSTR guidelines. Additionally, the Property is not currently participating in Ohio's VAP. However, data generated during this assessment were compared against action levels developed by BUSTR under Ohio Revised Code (ORC) 3737.882(B) and standards promulgated under Ohio Administrative Code (OAC) 3745-300-08 of Ohio's Voluntary Action Program (VAP) in the absence of other suitable program cleanup standards for comparison. Property-specific details, such as property occupant or soil type, can influence which standards should be used to compare each chemical of concern (COC). For the purposes of this assessment, BUSTR's non-residential land use was used, based on the current and MSG's understanding of the intended future use of the Property for commercial purposes. Additionally, the default BUSTR soil class, which is soil Class 1 (coarse grained soils) was used for comparison. The commercial and industrial land use and the construction and excavation activities categories were used when comparing soil results with the Ohio VAP generic direct-contact standards.

BUSTR action levels used as comparative standards for this assessment included delineation levels for soil and groundwater, soil direct contact, soil to indoor air, soil to outdoor air, soil TPH saturation values, soil to drinking water leaching, groundwater ingestion, groundwater to indoor air; and groundwater to outdoor air.

Ohio VAP standards used as comparative standards for this assessment included generic direct-contact soil standards for commercial/industrial use category and construction/excavation activities category; leach based soil values; and groundwater generic unrestricted potable use standards.

3.2 Soil Results

Table 2 presents a summary of soil data. Laboratory analytical reports and chain of custody forms are included in Appendix C.

Soil analytical results indicate that concentrations of several VOCs consisting of benzene, toluene, ethylbenzene, or xylenes were detected above the laboratory reporting limit in soil samples from borings MW-01, B-07, B-08, or B-09. Additionally, n-butylbenzene, sec-butylbenzene, isopropylbenzene, p-isopropyltoluene, naphthalene, n-propylbenzene, 1,2,4-trimethylbenzene, 1,2,3-trimethylbenzene, and 1,3,5-trimethylbenzene were detected above the laboratory reporting limit in the soil sample from boring B-09. The only VOC determined to exceed a comparative soil standard was benzene at MW-01 (4-6') and B-7 (4-6'), which exceeded the BUSTR soil leaching to drinking water action level and the Ohio VAP leach based soil value.

Soil analytical results indicate that naphthalene was the only PAH detected above the laboratory reporting limit in one sample from B-09. The naphthalene concentration at B-09 (6-8') did not exceed any of the comparative soil standards. PCBs were not detected above the laboratory reporting limits in any of the soil samples tested. The laboratory reporting limits were all below the comparison soil standards.

Lastly, concentrations of TPH C6-C12 and C10-C20 were detected above the laboratory reporting limit in soil samples from borings MW-01, B-07, B-08, or B-09. Concentrations of TPH C20-C34 were not detected above the laboratory reporting limit in any of the soil samples. None of the TPH concentrations exceeded the comparative soil standards.

3.3 Groundwater Results

Table 3 presents a summary of the groundwater analytical data. Laboratory analytical reports and chain of custody forms are included in Appendix C.

Groundwater analytical results indicate that concentrations of several VOCs consisting of BTEX and MTBE were detected above the laboratory reporting limit in groundwater samples from monitoring wells MW-01 and MW-04. The only VOC determined to exceed a comparative groundwater standard was benzene at MW-01, which exceeded the BUSTR Ingestion action level and the Ohio VAP unrestricted potable use standard.

Groundwater analytical results also indicate that pyrene and fluoranthene were the only PAHs detected above the laboratory reporting limit in the groundwater sample from monitoring well MW-05. The pyrene and fluoranthene concentrations at monitoring well MW-05 did not exceed any of the comparative groundwater standards.

4.0 CONCLUSIONS

MSG completed a Phase II ESA designed to assess potential impacts associated with the two RECs that were identified in MSG's Phase I ESA, dated April 2013. This Phase II assessment included a GPR survey, the installation of ten soil borings, and the conversion of six soil borings into permanent groundwater monitoring wells. Based on the field observations and the laboratory analytical results, MSG has made the following conclusions:

1. Three 10,000-gallon USTs remain on the Property near the southwest corner. A GPR and magnetic locator survey was completed in the eastern portion of the Property, which did not identify anomalies indicative of additional USTs being present on the Property.

2. Based on the analytical soil data, no constituents of concern (COCs) were detected in soil above the BUSTR action levels or Ohio VAP standards, except for the BUSTR soil to drinking water leaching action level and the Ohio VAP leach based soil values for benzene at two locations (MW-01 4-6' and B-07 4-6'). MSG recognizes that the CCLRC is not completing an Ohio VAP-compliant assessment of the Property; however, we compared the analytical results to VAP standards in the absence of a more suitable standard. The results indicate that the benzene concentrations in the soil could leach into and impact the groundwater. The building on the Property is connected to the public water supply and the groundwater at the Property is not used as a drinking water source. The two monitoring wells (MW-05 and MW-06) located downgradient of MW-01 and B-07 did not reveal concentrations of benzene in excess of the laboratory reporting limit. Given this, the benzene impacts appear to be localized near MW-01 and B-07. Additionally, because drinking water is provided to the Property and the surrounding areas by the City of Cleveland Division of Water, the elevated benzene concentrations are not anticipated to present a complete exposure pathway.

3. Based on the monitoring well gauging data, groundwater is flowing in a southern-southeastern direction across the Property. At only one location (MW-01), the benzene concentration exceeded the BUSTR groundwater ingestion action level and Ohio VAP unrestricted potable use standard. As stated above, the benzene concentrations at monitoring wells MW-05 and MW-06 (downgradient of MW-01) did not detect benzene in excess of the laboratory reporting limit. Therefore, the elevated benzene concentration appears to be relatively isolated and contained within the Property limits. Furthermore, as stated above, the Property does not use groundwater as a drinking water source and drinking water is provided to the Property and the surrounding areas by the City of Cleveland Division of Water. Therefore, the elevated benzene concentration at MW-01 will likely not present a complete exposure pathway.

Table 1
Groundwater Gauging Data Summary
14030 State Road, North Royalton, Ohio

Well ID	Depth to Groundwater (feet)*	Depth to Bottom of Well (feet)	Relative Elevation of Top of Casing	Relative Elevation of Groundwater	Screen Interval (feet)
MW-01	14.05	27.53	101.92	87.87	18-28
MW-02	11.6	27.43	99.66	88.06	18-28
MW-03	13.52	27.23	101.315	87.80	18-28
MW-04	12.77	27.25	101.02	88.25	18-28
MW-05	14.56	26.73	101.825	87.27	17.3-27.3
MW-06	15.2	31.13	102.915	87.72	22-32

* Depth to groundwater obtained on August 2, 2013

Table 2
Analytical Soil Data Summary
14030 State Road, North Royalton, Ohio

Sample Identification	MW-01	MW-02	MW-03	MW-04	MW-05	MW-06	B-07	B-08	B-09	B-10	Ohio VAP Commercial/ Industrial Generic Direct Contact Standards	Ohio VAP Construction/ Excavation Generic Direct Contact Standards	Ohio VAP Leach Based Soil Values	BUSTR Soil Delineation Levels	BUSTR Soil Direct Contact Action Level	BUSTR Soil to Drinking Water Leaching Action Level	BUSTR Soil to Indoor Air Action Level	Maximum Detected Values
Sample Depth (feet)	4-6	2-4	6-8	10-12	22-24	8-10	4-6	4-6	6-8	8-10								
Sample Date	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013								
Volatile Organic Compounds (VOCs) USEPA Method 8260																		
Benzene	0.41	<0.0063	<0.0065	<0.0057	<0.0057	<0.0058	0.39	0.018	<0.0059	<0.0059	140	150	0.017	1.04	100	0.149	1.04	0.41
Toluene	2.4	<0.031	<0.033	<0.029	<0.028	<0.029	<0.3	<0.031	<0.03	<0.03	520	520	6.8	61.3	5,900	49.1	61.3	2.4
Ethylbenzene	11	<0.0063	<0.0065	<0.0057	<0.0057	<0.0058	3.1	0.22	0.021	<0.0059	230	230	12	199	17,000	45.5	199	11
Xylenes	54	<0.019	<0.02	<0.017	<0.017	<0.017	7.6	0.28	0.024	<0.018	370	370	156	15.7	6,400	469	15.7	54
Methyl tert-butyl ether	<0.24	<0.0063	<0.0065	<0.0057	<0.0057	<0.0058	<0.06	<0.0062	<0.0059	<0.0059	1,900	6,700	NS	1,240	57,000	0.47	1,240	--
n-Butylbenzene	NT	NT	<0.0065	NT	<0.0057	NT	NT	NT	0.051	NT	178	178	NS	NS	NS	NS	NS	0.051
Sec-Butylbenzene	NT	NT	<0.0065	NT	<0.0057	NT	NT	NT	0.02	NT	764	764	NS	NS	NS	NS	NS	0.02
Isopropylbenzene	NT	NT	<0.0065	NT	<0.0057	NT	NT	NT	0.015	NT	260	260	NS	NS	NS	NS	NS	0.015
p-Isopropyltoluene	NT	NT	<0.0065	NT	<0.0057	NT	NT	NT	0.01	NT	573	573	NS	NS	NS	NS	NS	0.01
Naphthalene	NT	NT	<0.0065	NT	<0.0057	NT	NT	NT	0.067	NT	150	84	0.27	54	530	39.8	54	0.067
n-Propylbenzene	NT	NT	<0.0065	NT	<0.0057	NT	NT	NT	0.06	NT	236	236	NS	NS	NS	NS	NS	0.06
1,2,4-trimethylbenzene	NT	NT	<0.0065	NT	<0.0057	NT	NT	NT	0.28	NT	120	35	NS	NS	NS	NS	NS	0.28
1,2,3-trimethylbenzene	NT	NT	<0.0065	NT	<0.0057	NT	NT	NT	0.059	NT	NS	NS	NS	NS	NS	NS	NS	0.059
1,3,5-trimethylbenzene	NT	NT	<0.0065	NT	<0.0057	NT	NT	NT	0.031	NT	95	200	NS	NS	NS	NS	NS	0.031
All Other VOCs	NT	NT	ND	NT	ND	NT	NT	NT	ND	NT	NS	NS	NS	NS	NS	NS	NS	--
Polynuclear Aromatic Hydrocarbons (PAHs) USEPA Method 8270																		
Naphthalene	NT	NT	<0.043	NT	<0.037	NT	NT	NT	0.38	NT	150	84	0.27	54	530	39.8	54	0.38
All other PAHs	NT	NT	ND	NT	ND	NT	NT	NT	ND	NT	NS	NS	NS	NS	NS	NS	NS	--
Polychlorinated Biphenyls (PCBs) USEPA Method 8082																		
All PCBs	NT	NT	<0.022	NT	<0.019	NT	NT	NT	<0.02	NT	18	42	NS	NS	NS	NS	NS	--
Total Petroleum Hydrocarbons (TPH) USEPA Method 8015M																		
TPH C6-C12	24	<0.63	<0.65	<0.57	<0.57	<0.58	100	8.0	450	<0.59	1,000	NS	NS	1,000	NS	NS	NS	450
TPH C10-C-20	45	<5.0	<5.2	<4.6	<4.5	<4.0	17	8.4	4.8	<4.7	2,000	NS	NS	2,000	NS	NS	NS	45
TPH C20-C34	<4.7	<5.0	<5.2	<4.6	<4.5	<4.0	<4.8	<4.9	<4.7	<4.7	5,000	NS	NS	5,000	NS	NS	NS	--

NT = not tested
ND = not detected
NS = no standard
BUSTR = Bureau of Underground Storage Tank Regulations
VAP = Ohio EPA Voluntary Action Program
Bold Values Exceed a Standard
All Value are reported in mg/kg

Table 3

Analytical Groundwater Data Summary

14030 State Road, North Royalton, Ohio

Sample Identification	MW-01	MW-02	MW-03	MW-04	MW-05	MW-06	Ohio VAP Unrestricted Potable Use Standard (UPUS)	BUSTR Ingestion Action Levels	BUSTR Groundwater to Indoor Air Action Levels	Maximum Detected Values
Sample Date	8/2/2013	8/2/2013	8/2/2013	8/2/2013	8/2/2013	8/2/2013				
Volatile Organic Compounds (VOCs) USEPA Method 8260										
Benzene	0.21	<0.0005	<0.001	<0.0005	<0.001	<0.0005	0.005	0.005	26.8	0.21
Toluene	0.088	<0.005	<0.005	<0.005	<0.005	<0.005	1.0	1.0	2510	0.088
Ethylbenzene	0.1	<0.0005	<0.001	<0.0005	<0.001	<0.0005	0.7	0.7	6,180	0.1
Xylenes	0.38	<0.0015	<0.003	<0.0015	<0.003	<0.0015	10	10	670	0.38
Methyl tert-butyl ether	0.025	<0.001	<0.001	0.0049	<0.001	<0.001	0.04	0.04	200,000	0.025
All other VOCs	NT	NT	ND	NT	ND	NT	NS	NS	NS	--
Polynuclear Aromatic Hydrobarbons (PAHs) USEPA Method 8270										
Flouranthene	NT	NT	<0.00005	NT	0.000069	NT	0.42	NS	NS	0.000069
Pyrene	NT	NT	<0.00005	NT	0.00005	NT	0.47	NS	NS	0.00005
All other PAHs	NT	NT	ND	NT	ND	NT	NS	NS	NS	--

NT = not tested

ND = not detected

NS = no standard

BUSTR = Bureau of Underground Storage Tank Regulations

VAP = Ohio EPA Voluntary Action Program

Bold Values Exceed a Standard

All Value are reported in mg/L

FIGURES

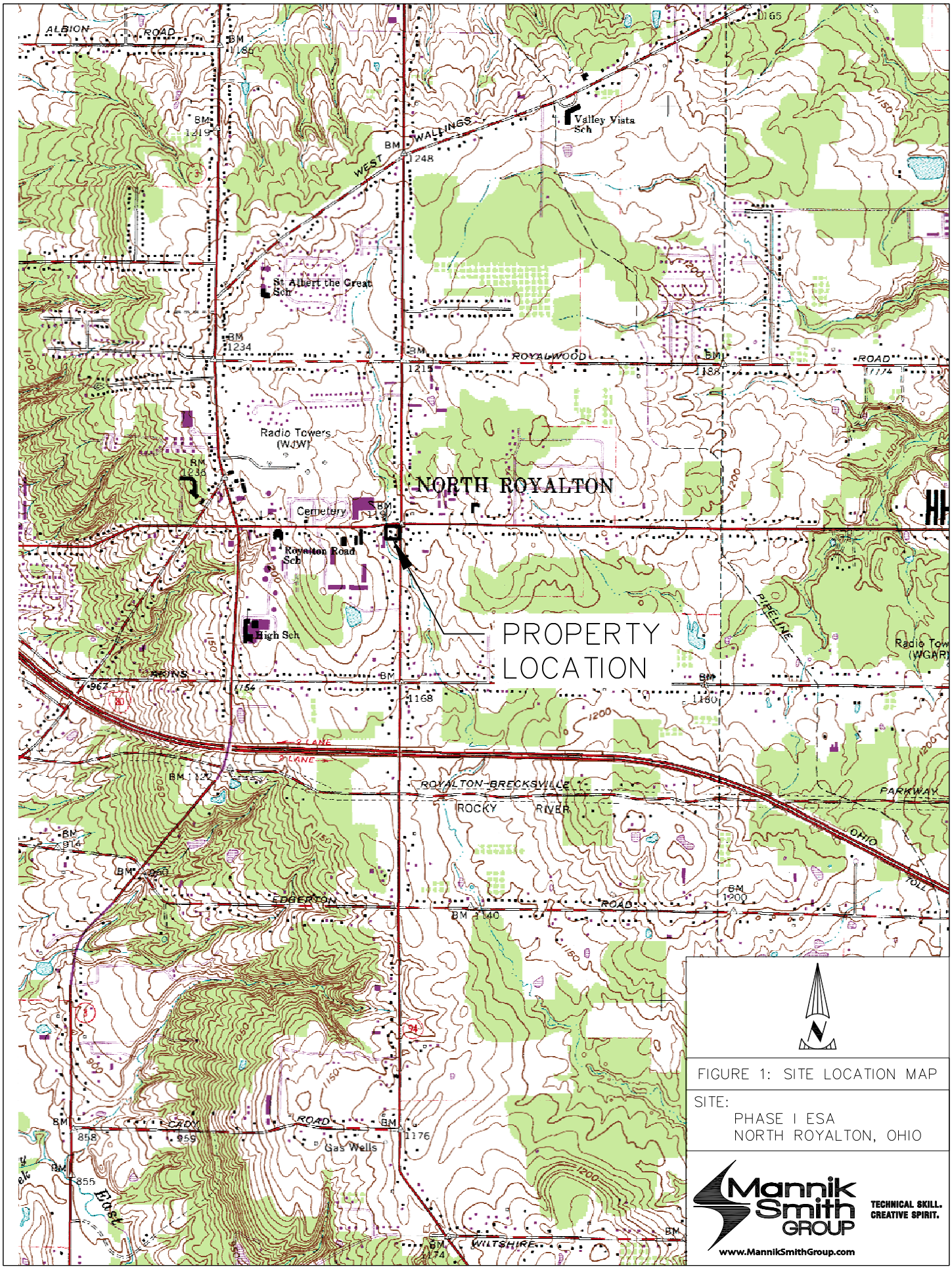

FIGURE 1: SITE LOCATION MAP

SITE:
PHASE I ESA
NORTH ROYALTON, OHIO

Mannik Smith GROUP
TECHNICAL SKILL. CREATIVE SPIRIT.
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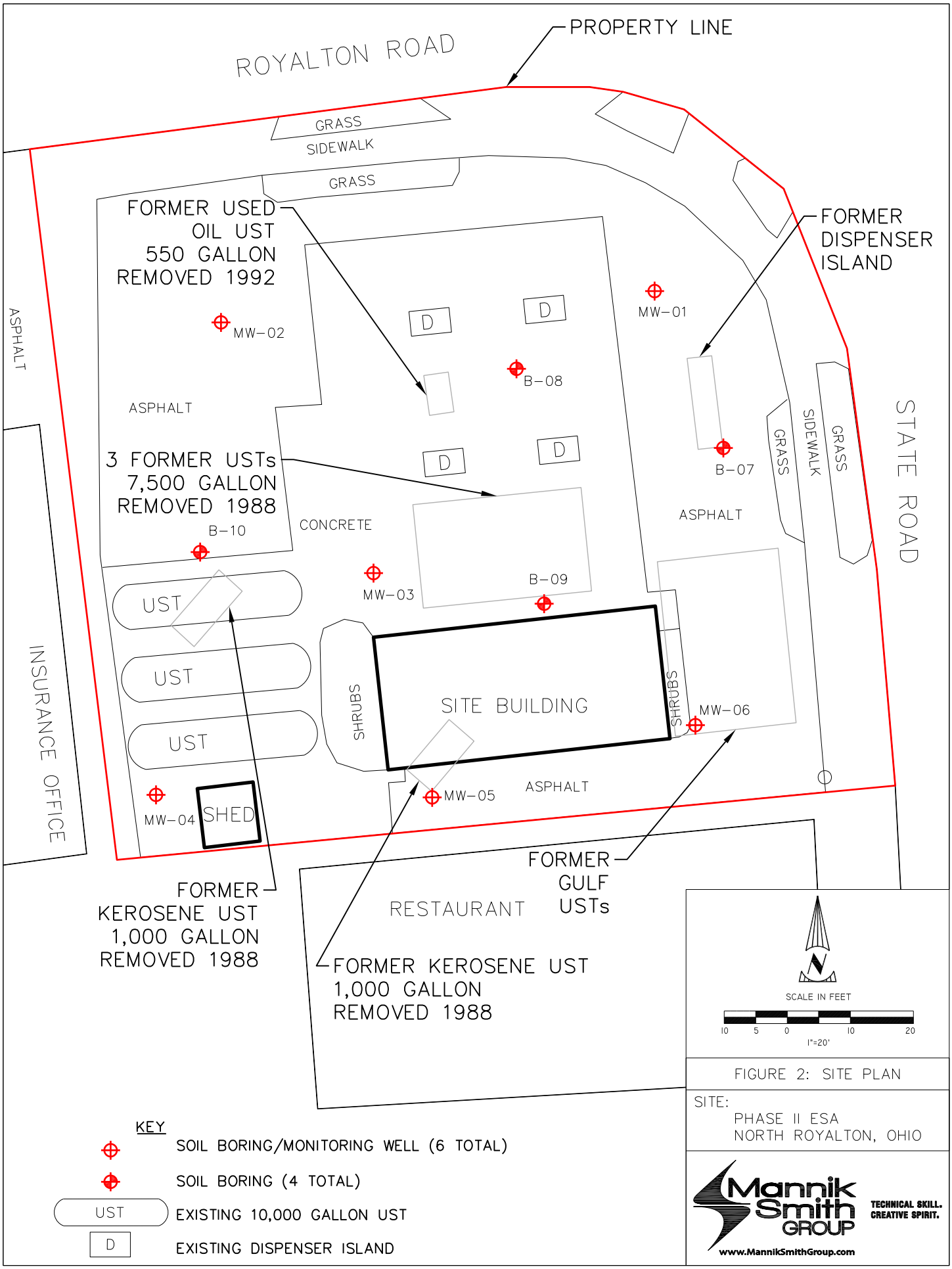
ROYALTON ROAD
PROPERTY LINE
GRASS
SIDEWALK
GRASS
FORMER USED OIL UST 550 GALLON REMOVED 1992
FORMER DISPENSER ISLAND
MW-01
MW-02
D
D
B-08
ASPHALT
ASPHALT
3 FORMER USTs 7,500 GALLON REMOVED 1988
D
D
B-07
GRASS
SIDEWALK
GRASS
STATE ROAD
B-10
CONCRETE
ASPHALT
MW-03
B-09
UST
UST
UST
SHRUBS
SITE BUILDING
SHRUBS
MW-06
INSURANCE OFFICE
MW-04
SHED
MW-05
ASPHALT
FORMER KEROSENE UST 1,000 GALLON REMOVED 1988
RESTAURANT
FORMER GULF USTs
FORMER KEROSENE UST 1,000 GALLON REMOVED 1988
KEY
SOIL BORING/MONITORING WELL (6 TOTAL)
SOIL BORING (4 TOTAL)
UST
EXISTING 10,000 GALLON UST
D
EXISTING DISPENSER ISLAND
SCALE IN FEET
10 5 0 10 20
1"=20'
FIGURE 2: SITE PLAN
SITE:
PHASE II ESA
NORTH ROYALTON, OHIO
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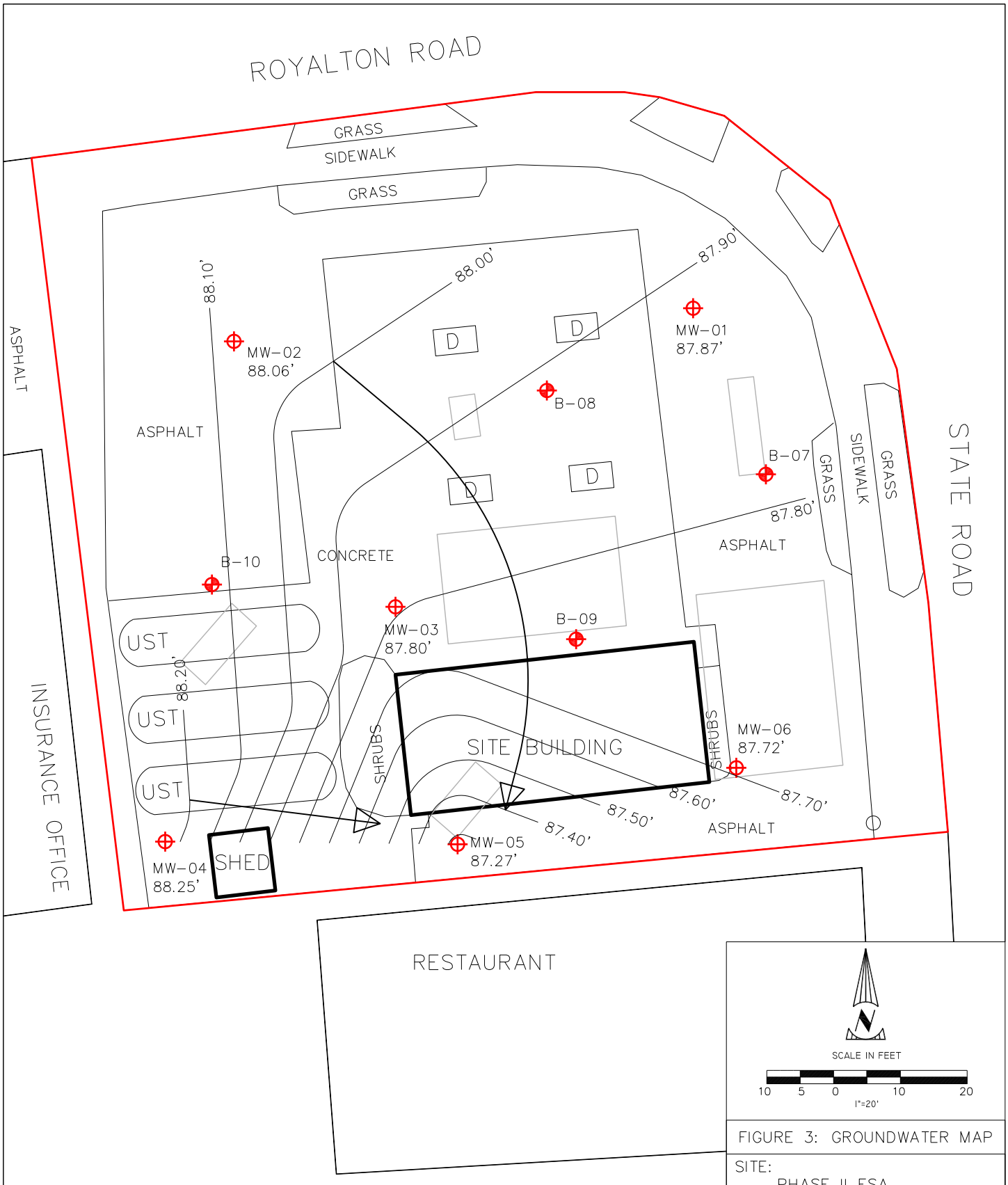

KEY

- SOIL BORING/MONITORING WELL (6 TOTAL)
- SOIL BORING (4 TOTAL)
- UST — EXISTING 10,000 GALLON UST
- D — EXISTING DISPENSER ISLAND

SCALE IN FEET

10 5 0 10 20

1"=20'

FIGURE 3: GROUNDWATER MAP

SITE:
PHASE II ESA
NORTH ROYALTON, OHIO

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APPENDIX A
GROUND PENETRATING RADAR REPORT

BEHR GEO ENVIRONMENTAL LLC
688 DEEPWOODS DRIVE, AURORA, OHIO 44202
216-906-7752

July 15, 2013 Behr130027

Mr. Matt Danus
Mannik Smith Group
23225 Mercantile Road
Beachwood, Ohio 44122

Re: Ground Penetrating Radar and Magnetic Locator Survey
Former Gasoline Service Station
14030 State Road
North Royalton, Ohio

Dear Mr. Danus,

Behr Geo Environmental LLC (Behr) was retained by Mannik Smith Group (MSG) to complete ground penetrating radar (GPR) and magnetic locator surveys of a portion of the property located at 14030 State Road, North Royalton, Ohio (Subject Property).

Historical records indicate that there may have been one or more underground storage tanks (USTs) near the southeast corner of the Subject Property. MSG was reportedly unable to obtain records documenting the closure of any USTs from this portion of the Subject Property, therefore, it was suspected that USTs could remain.

This GPR and magnetic locator survey was performed to attempt to located USTs that may remain in the southeast portion of the Subject Property.

GPR Survey

A GPR survey was performed over the area shown on **Figure 1** using a Mala Ramac X3M ground penetrating radar unit with a 500 MHz transducer/receiver antenna over a grid with an approximately 5-foot line spacing. The survey area was defined based upon information provided by MSG personnel and consisted of one approximately 30-ft by 60-ft mostly asphalt-paved area.

The effective penetration depth of the GPR signal during this survey appeared to range from approximately 3 to 5-feet below the ground surface over most of the area surveyed. There was no evidence of significant near-surface signal interference within the survey areas.

No anomalies that were consistent with what would be produced by a UST were present in the survey area.

Magnetic Locator Survey

In conjunction with the GPR survey, a magnetic locator survey was completed at the subject property. The magnetic locator survey was completed over the same area as the GPR survey shown on **Figure 1**. The survey was completed using a Schonstedt GA-52Cx Magnetic Locator on an approximately 8-foot to 10-foot line spacing. Traverses of the subject property with the magnetic locator were completed in a north-south and in an east-west direction over the survey area.

No magnetic anomalies that were consistent with what would be produced by a UST were identified in the areas of the GPR survey.

Magnetic interference was encountered within about 5-feet of the existing building. Other than adjacent to the existing building, there were no other areas of significant signal interference at the Subject Property.

Conclusions

The GPR and magnetic locator surveys identified no anomalies consistent with what would be produced by a UST in the survey area. Based upon the lack of GPR and magnetic locator anomalies, it is Behr's opinion that no USTs are present within the survey area.

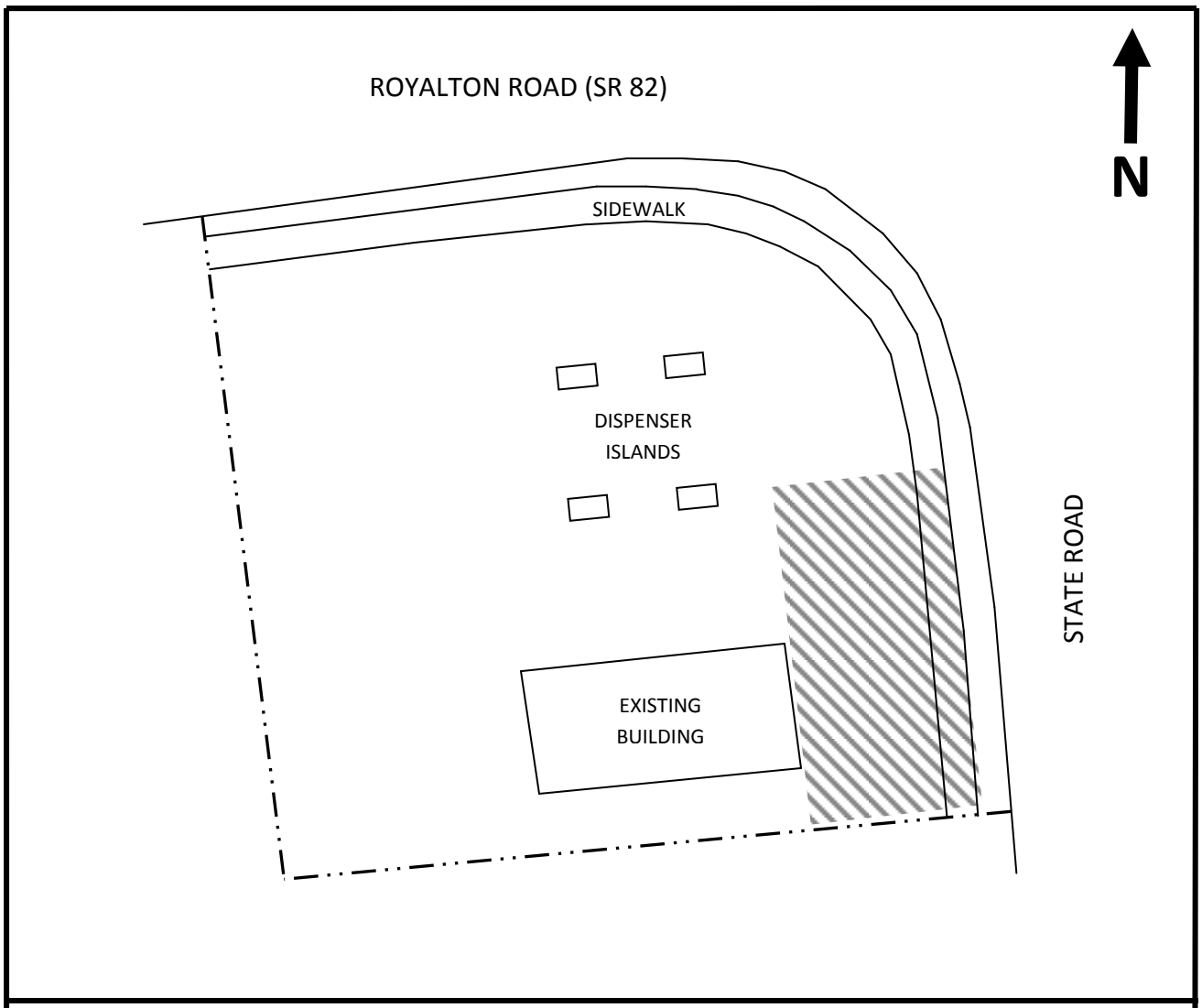
Closing

We appreciate the opportunity to work with you on this project. Please call Behr Geo Environmental LLC at 216-906-7752 if you have any questions or if we can be of further assistance.

Sincerely,

BEHR GEO ENVIRONMENTAL LLC

David W. Behringer, PG, CP
Owner



Legend

= GPR and Magnetic Locator Survey Area (no suspected UST anomalies)

Scale in Feet

0 20 40

Figure 1: GPR and Magnetic Locator Survey Plan

FORMER GASOLINE SERVICE STATION
14030 State Road
North Royalton, Ohio

BEHR GEO ENVIRONMENTAL LLC

APPENDIX B

SOIL BORING LOGS & WELL CONSTRUCTION DETAILS

Page 1 of 1

Soil Boring / Monitoring Well Number: MW-01

Project Number: C3210006
Project Name: Phase II ESA
Site Location: 14030 State Road, North Royalton
Client: Cuyahoga County Land Reutilization Corp
MSG Personnel: JNB

Contractor: Envirocore
Driller: Jake Bradley
Drilling Method: Geoprobe Continuous Sampling
Drill Rig: Geoprobe
Total Depth: 28 feet

MW Installation Date: 8/1/2013
Northing: NA
Easting: NA
Ground Surface Elev.: NA

Depth (ft)	Elev. (ft.)	Well Diagram (Casing Type: 1" PVC)	Elev. (ft.)	Graphic Log	Description of Cuttings	Number	Type	FID/PID (ppm)	Recovery (in.)	Remarks
		Concrete Pad			Ashpalt					
					Red Brick	1	DT	2.0	12	
					Black, Gray Clay, Soft					
					Brown Clay with Gray Mottling	2	DT	14.8	12	
5		PVC Riser				3	DT	109.5	20	Submitted to Lab
						4	DT	78.3	20	
		Bentonite Chips				5	DT	41.3	24	
10						6	DT	18.6	24	
					Gray Clay with some Brown Clay	7	DT	0.4	24	
					Brown Clay with Shale Fragments	8	DT	1.3	24	
15						9	DT	0.3	24	
		Sand				10	DT	0.3	24	
20						11	DT	0.3	18	
		Slotted Pre-Packed Screen			Gray Sand with Large Shale Fragments, Moist	12	DT	0.0	18	
					Gray Sand, Moist	13	DT	0.0	17	
25					Gray Sand, Wet	14	DT	0.0	17	
					End of Soil Boring = 28 feet					
30										

Page 1 of 1

Soil Boring / Monitoring Well Number: MW-02

Project Number: C3210006
Project Name: Phase II ESA
Site Location: 14030 State Road, North Royalton
Client: Cuyahoga County Land Reutilization Corp
MSG Personnel: JNB

Contractor: Envirocore
Driller: Jake Bradley
Drilling Method: Geoprobe Continuous Sampling
Drill Rig: Geoprobe
Total Depth: 28 feet

MW Installation Date: 8/1/2013
Northing: NA
Easting: NA
Ground Surface Elev.: NA

Depth (ft)	Elev. (ft.)	Well Diagram (Casing Type: 1" PVC)	Elev. (ft.)	Graphic Log	Description of Cuttings	Number	Type	FID/PID (ppm)	Recovery (in.)	Remarks
		Concrete Pad			Asphalt					
					Dark Brown Clay	1	DT	0.0	16	
					Gray Clay with Orange Mottling, Black Mottling at 8 feet	2	DT	0.0	16	Submitted to Lab
5		PVC Riser				3	DT	0.0	19	
						4	DT	0.0	19	
		Bentonite Chips				5	DT	0.0	24	
10					Brown Clay with Shale Fragments	6	DT	0.0	24	
					Brown Clay with Orange, Gray Mottling	7	DT	0.0	24	
15						8	DT	0.0	24	
					Gray Clay, Soft	9	DT	0.0	18	
		Sand			Gray Clay, Moist	10	DT	0.0	18	
20					Gray Sand, Wet	11	DT	0.0	20	
		Slotted Pre-Packed Screen				12	DT	0.0	20	
25						13	DT	0.0	20	
					Gray/ Brown Clay, Gravelly, Moist	14	DT	0.0	20	
					End of Soil Boring = 28 feet					
30										

Page 1 of 1

Soil Boring / Monitoring Well Number: MW-03

Project Number: C3210006
Project Name: Phase II ESA
Site Location: 14030 State Road, North Royalton
Client: Cuyahoga County Land Reutilization Corp
MSG Personnel: JNB

Contractor: Envirocore
Driller: Jake Bradley
Drilling Method: Geoprobe Continuous Sampling
Drill Rig: Geoprobe
Total Depth: 28 feet

MW Installation Date: 8/1/2013
Northing: NA
Easting: NA
Ground Surface Elev.: NA

Depth (ft)	Elev. (ft.)	Well Diagram (Casing Type: 1" PVC)	Elev. (ft.)	Graphic Log	Description of Cuttings	Number	Type	FID/PID (ppm)	Recovery (in.)	Remarks
		Concrete Pad			Concrete, Fill, Subbase Material, Sand & Gravel	1	DT	0.0	17	
					Fill: Gray Clay	2	DT		0	No Recovery
5		PVC Riser				3	DT	0.0	15	
					Brown Clay with Gray Mottling, Dry	4	DT	0.0	15	Submitted to Lab
		Bentonite Chips				5	DT	0.0	24	
10					Gray Brown Clay with Orange Mottling, Shale Fragments	6	DT	0.0	24	
					Gray Clay with Shale Fragments, Moist at 18 feet	7	DT	0.0	24	
15						8	DT	0.0	24	
						9	DT	0.0	20	
		Sand			Gray Clay with Shale Fragments, Moist, Soft	10	DT	0.0	20	
20						11	DT	0.0	20	
		Slotted Pre-Packed Screen			Gray Brown Clay with Sand, Some Gravel	12	DT	0.0	12	
					Gray Sand with Gravel, Wet	13	DT	0.0	16	
25					Gray Sand with Gravel, some Gray Clay, Wet	14	DT	0.0	16	
					End of Soil Boring = 28 feet					
30										

Page 1 of 1

Soil Boring / Monitoring Well Number: MW-04

Project Number: C3210006
Project Name: Phase II ESA
Site Location: 14030 State Road, North Royalton
Client: Cuyahoga County Land Reutilization Corp
MSG Personnel: JNB

Contractor: Envirocore
Driller: Jake Bradley
Drilling Method: Geoprobe Continuous Sampling
Drill Rig: Geoprobe
Total Depth: 28 feet

MW Installation Date: 8/1/2013
Northing: NA
Easting: NA
Ground Surface Elev.: NA

Depth (ft)	Elev. (ft.)	Well Diagram (Casing Type: 1" PVC)	Elev. (ft.)	Graphic Log	Description of Cuttings	Number	Type	FID/PID (ppm)	Recovery (in.)	Remarks
		Concrete Pad			Concrete					
					Brown Clay with Sand	1	DT	0.0	12	
						2	DT		0	No Recovery
5		PVC Riser			Brown Clay with Gray Mottling	3	DT	0.0	12	
						4	DT	0.0	12	
		Bentonite Chips				5	DT	0.0	24	
10						6	DT	0.0	24	Submitted to Lab
						7	DT	0.0	24	
15					Brown Clay, Soft	8	DT	0.0	24	
					Gray Clay, Soft	9	DT	0.0	19	
		Sand				10	DT	0.0	19	
20						11	DT	0.0	16	
		Slotted Pre-Packed Screen				12	DT		0	No Recovery
25						13	DT	0.0	24	
					Gray Sand. Wet	14	DT	0.0	24	
					End of Soil Boring = 28 feet					
30										

Mannik Smith GROUP

Soil Boring / Monitoring Well Number: MW-05

Project Number: C3210006
Project Name: Phase II ESA
Site Location: 14030 State Road, North Royalton
Client: Cuyahoga County Land Reutilization Corp
MSG Personnel: JNB

Contractor: Envirocore
Driller: Jake Bradley
Drilling Method: Geoprobe Continuous Sampling
Drill Rig: Geoprobe
Total Depth: 27.3 feet

MW Installation Date: 7/31/2013
Northing: NA
Easting: NA
Ground Surface Elev.: NA

Depth (ft)	Elev. (ft.)	Well Diagram (Casing Type: 1" PVC)	Elev. (ft.)	Graphic Log	Description of Cuttings	Number	Type	FID/PID (ppm)	Recovery (in.)	Remarks
		Concrete Pad			Asphalt					
					Fill, Brown Clay with Roots	1	DT	0.0	13	
					Brown Clay with Orange Mottling, Soft	2	DT	0.0	13	
5		PVC Riser			Brown Clay with Orange Mottling, Hard	3	DT	0.0	20	
					Brown Clay, Hard	4	DT	0.0	20	
		Bentonite Chips			Brown Clay with Gray Mottling	5	DT	0.0	24	
10						6	DT	0.0	24	
						7	DT	0.0	24	
15					Gray Clay with trace of Shale	8	DT	0.0	24	
					Brown Clay	9	DT	0.0	24	
		Sand			Gray Clay, Wet	10	DT	0.0	24	
20						11	DT	0.0	22	
		Slotted Pre-Packed Screen			Brown, Gray Sand with trace small gravel, Wet	12	DT	0.5	22	Submitted to Lab
25					End of Soil Boring = 27.3 feet					
30										

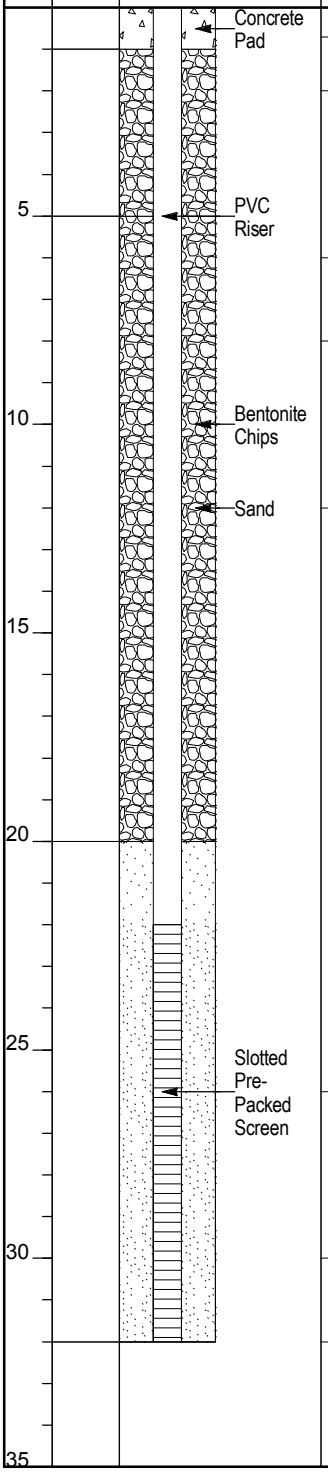
Mannik Smith GROUP

Soil Boring / Monitoring Well Number: MW-06

Project Number: C3210006
Project Name: Phase II ESA
Site Location: 14030 State Road, North Royalton
Client: Cuyahoga County Land Reutilization Corp
MSG Personnel: JNB

Contractor: Envirocore
Driller: Jake Bradley
Drilling Method: Geoprobe Continuous Sampling
Drill Rig: Geoprobe
Total Depth: 32 feet

MW Installation Date: 8/1/2013
Northing: NA
Easting: NA
Ground Surface Elev.: NA



Depth (ft)	Elev. (ft.)	Elev. (ft.)	Description of Cuttings	Number	Type	FID/PID (ppm)	Recovery (in.)	Remarks
			Concrete					
			Fill, Brown Clay	1	DT	0.0	16	
			Brown Clay with Gray Mottling	2	DT		0	No Recovery
				3	DT	0.0	12	
			Brown Clay with Gray, Orange Mottling, trace of Sand	4	DT	0.0	12	
			Brown Clay with some Gray Clay	5	DT	0.1	24	Submitted to Lab
				6	DT	0.0	24	
			Gray Clay with trace of Shale Fragments	7	DT	0.0	24	
				8	DT	0.0	24	
				9	DT	0.0	20	
				10	DT	0.0	20	
				11	DT	0.0	22	
				12	DT	0.0	22	
				13	DT	0.0	9	
			Gray, Brown Sandy Clay, Wet	14	DT		0	No Recovery
				15	DT	0.0	15	
			Gray Clay with Gravel, Wet	16	DT	0.0	15	
			End of Soil Boring = 32 feet					

Mannik Smith GROUP

Soil Boring Number: B-07

Project Number: C3210006
Project Name: Phase II ESA
Site Location: 14030 State Road, North Royalton
Client: Cuyahoga County Land Reutilization Corp
MSG Personnel: JNB

Approved By: JAZ
Contractor: Envirocore
Driller: Jake Bradley
Drilling Method: Geoprobe Continuous Sampling
Drill Rig: Geoprobe

Start/End Date: 7/31/2013
Boring Depth: 16 feet
Northing: NA
Easting: NA
Ground Surface Elev.: NA

Depth (ft)	Elev. (ft.)	Graphic Log	Description	Number	Type	FID/PID (ppm)	Recovery (in.)	Remarks
			Asphalt					
			Gray Clay with Black Mottling, Gravel	1	DT	5.0	10	
			Gray Clay with Orange Mottling	2	DT	1.8	10	
5			Brown Clay with Gray Mottling	3	DT	355	15	Submitted to Lab
			Brown Clay with Gray, Orange Mottling, trace of Gravel	4	DT	6.0	15	
			Brown Clay with Gray Mottling, trace of Shale Fragments	5	DT	0.4	24	
10				6	DT	0.0	24	
			Brown Clay	7	DT	0.0	24	
15			Dark Brown Clay, trace of Shale Fragments, Soft	8	DT	0.0	24	
			End of Soil Boring = 16 feet					
20								

Mannik Smith GROUP

Soil Boring Number: B-08

Project Number: C3210006
Project Name: Phase II ESA
Site Location: 14030 State Road, North Royalton
Client: Cuyahoga County Land Reutilization Corp
MSG Personnel: JNB

Approved By: JAZ
Contractor: Envirocore
Driller: Jake Bradley
Drilling Method: Geoprobe Continuous Sampling
Drill Rig: Geoprobe

Start/End Date: 7/31/2013
Boring Depth: 12 feet
Northing: NA
Easting: NA
Ground Surface Elev.: NA

Depth (ft)	Elev. (ft.)	Graphic Log	Description	Number	Type	FID/PID (ppm)	Recovery (in.)	Remarks
			Gravel					
			Brown Sand, Odor	1	DT	0.0	10	
			Black Clay, Brown Mottling, Odor	2	DT	0.0	10	
5			Brown Clay with Gray Mottling, Soft, Odor	3	DT	411	12	Submitted to Lab
			Brown Clay with Gray Mottling, Hard, Odor	4	DT	3.4	12	
			Brown Clay with Gray, Orange Mottling, trace of Shale Fragments, Odor	5	DT	0.8	24	
10				6	DT	0.3	24	
			End of Soil Boring = 12 feet					
15								
20								

Page 1 of 1

Soil Boring Number: B-09

Project Number: C3210006
Project Name: Phase II ESA
Site Location: 14030 State Road, North Royalton
Client: Cuyahoga County Land Reutilization Corp
MSG Personnel: JNB

Approved By: JAZ
Contractor: Envirocore
Driller: Jake Bradley
Drilling Method: Geoprobe Continuous Sampling
Drill Rig: Geoprobe

Start/End Date: 7/31/2013
Boring Depth: 10 feet
Northing: NA
Easting: NA
Ground Surface Elev.: NA

Depth (ft)	Elev. (ft.)	Graphic Log	Description	Number	Type	FID/PID (ppm)	Recovery (in.)	Remarks
			Concrete					
			Fill: Brown Clay with Gray Mottling, trace of Sand	1	DT	1.5	12	
				2	DT		0	No Recovery
5			Fill: Orange, Red Sand with some Gravel	3	DT	13.4	8	
			Fill: Black, Brown Sandy Clay with trace of small and large Gravel, Odor	4	DT	187.6	8	Submitted to Lab
10			Fill: Black, Brown Sandy Clay with trace of small and large Gravel, trace of large wood chips, Odor	5	DT	7.0	6	
			End of Soil Boring = 10 feet					
15								
20								

Mannik Smith GROUP

Soil Boring Number: B-10

Project Number: C3210006
Project Name: Phase II ESA
Site Location: 14030 State Road, North Royalton
Client: Cuyahoga County Land Reutilization Corp
MSG Personnel: JNB

Approved By: JAZ
Contractor: Envirocore
Driller: Jake Bradley
Drilling Method: Geoprobe Continuous Sampling
Drill Rig: Geoprobe

Start/End Date: 7/31/2013
Boring Depth: 12 feet
Northing: NA
Easting: NA
Ground Surface Elev.: NA

Depth (ft)	Elev. (ft.)	Graphic Log	Description	Number	Type	FID/PID (ppm)	Recovery (in.)	Remarks
			Asphalt					
			Brown, Black, Clay with Gray, Black, Orange Mottling	1	DT	0.1	14	
				2	DT		0	No Recovery
5				3	DT	0.1	16	
				4	DT	0.0	16	
				5	DT	0.5	24	Submitted to Lab
10			Gray Clay with Orange Mottling	6	DT	0.0	24	
			End of Soil Boring = 12 feet					
15								
20								

APPENDIX C
LABORATORY ANALYTICAL REPORTS AND CHAIN OF CUSTODIES

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

Report Summary

Wednesday August 14, 2013

Report Number: L650036
Samples Received: 08/03/13
Client Project: C3210006

Description: North Royalton Phase II ESA

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: Leslie Newton

Leslie Newton , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.
Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

ESC LAB SCIENCES
YOUR LAB OF CHOICE

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-01

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : DUP 073113

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	86.4	0.100	%	2540 G-2011	08/08/13	1
Benzene	BDL	0.0029	mg/kg	8021	08/08/13	5
Toluene	BDL	0.029	mg/kg	8021	08/08/13	5
Ethylbenzene	BDL	0.0029	mg/kg	8021	08/08/13	5
Total Xylene	BDL	0.0087	mg/kg	8021	08/08/13	5
Methyl tert-butyl ether	BDL	0.0058	mg/kg	8021	08/08/13	5
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	08/08/13	5

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
This report shall not be reproduced, except in full, without the written approval from ESC.
The reported analytical results relate only to the sample submitted
Reported: 08/09/13 16:39 Revised: 08/14/13 11:09

ESC LAB SCIENCES
YOUR LAB OF CHOICE

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-02

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : EB 073113

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(b)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(g,h,i)perylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(k)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Chrysene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Dibenz(a,h)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluorene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Naphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Phenanthrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
1-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
2-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
2-Chloronaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Surrogate Recovery						
Nitrobenzene-d5	72.3		% Rec.	8270 C-SIM	08/08/13	1
2-Fluorobiphenyl	76.9		% Rec.	8270 C-SIM	08/08/13	1
p-Terphenyl-d14	74.7		% Rec.	8270 C-SIM	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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Est. 1970

REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-03

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : FB 073113

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(b)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(g,h,i)perylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(k)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Chrysene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Dibenz(a,h)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluorene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Naphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Phenanthrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
1-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
2-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
2-Chloronaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Surrogate Recovery						
Nitrobenzene-d5	82.3		% Rec.	8270 C-SIM	08/08/13	1
2-Fluorobiphenyl	83.0		% Rec.	8270 C-SIM	08/08/13	1
p-Terphenyl-d14	78.0		% Rec.	8270 C-SIM	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-04

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : MW-01

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.21	0.00050	mg/l	8021	08/06/13	1
Toluene	0.088	0.0050	mg/l	8021	08/06/13	1
Ethylbenzene	0.10	0.00050	mg/l	8021	08/06/13	1
Total Xylene	0.38	0.0015	mg/l	8021	08/06/13	1
Methyl tert-butyl ether	0.025	0.0010	mg/l	8021	08/06/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	08/06/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-05

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : MW-02

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	08/06/13	1
Toluene	BDL	0.0050	mg/l	8021	08/06/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021	08/06/13	1
Total Xylene	BDL	0.0015	mg/l	8021	08/06/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/l	8021	08/06/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	96.3		% Rec.	8021	08/06/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-06

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : MW-03

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Volatile Organics						
Acetone	BDL	0.050	mg/l	8260B	08/06/13	1
Acrylonitrile	BDL	0.010	mg/l	8260B	08/06/13	1
Benzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Bromobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Bromodichloromethane	BDL	0.0010	mg/l	8260B	08/06/13	1
Bromoform	BDL	0.0010	mg/l	8260B	08/06/13	1
Bromomethane	BDL	0.0050	mg/l	8260B	08/06/13	1
n-Butylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
sec-Butylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
tert-Butylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Carbon tetrachloride	BDL	0.0010	mg/l	8260B	08/06/13	1
Chlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Chlorodibromomethane	BDL	0.0010	mg/l	8260B	08/06/13	1
Chloroethane	BDL	0.0050	mg/l	8260B	08/06/13	1
2-Chloroethyl vinyl ether	BDL	0.050	mg/l	8260B	08/06/13	1
Chloroform	BDL	0.0050	mg/l	8260B	08/06/13	1
Chloromethane	BDL	0.0025	mg/l	8260B	08/06/13	1
2-Chlorotoluene	BDL	0.0010	mg/l	8260B	08/06/13	1
4-Chlorotoluene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,2-Dibromo-3-Chloropropane	BDL	0.0050	mg/l	8260B	08/06/13	1
1,2-Dibromoethane	BDL	0.0010	mg/l	8260B	08/06/13	1
Dibromomethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,2-Dichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,3-Dichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,4-Dichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Dichlorodifluoromethane	BDL	0.0050	mg/l	8260B	08/06/13	1
1,1-Dichloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,2-Dichloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1-Dichloroethene	BDL	0.0010	mg/l	8260B	08/06/13	1
cis-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	08/06/13	1
trans-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,2-Dichloropropane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1-Dichloropropene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,3-Dichloropropane	BDL	0.0010	mg/l	8260B	08/06/13	1
cis-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	08/06/13	1
trans-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	08/06/13	1
2,2-Dichloropropane	BDL	0.0010	mg/l	8260B	08/06/13	1
Di-isopropyl ether	BDL	0.0010	mg/l	8260B	08/06/13	1
Ethylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Hexachloro-1,3-butadiene	BDL	0.0010	mg/l	8260B	08/06/13	1
n-Hexane	BDL	0.010	mg/l	8260B	08/06/13	1
Isopropylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
p-Isopropyltoluene	BDL	0.0010	mg/l	8260B	08/06/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-06

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : MW-03

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
2-Butanone (MEK)	BDL	0.010	mg/l	8260B	08/06/13	1
Methylene Chloride	BDL	0.0050	mg/l	8260B	08/06/13	1
4-Methyl-2-pentanone (MIBK)	BDL	0.010	mg/l	8260B	08/06/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/l	8260B	08/06/13	1
Naphthalene	BDL	0.0050	mg/l	8260B	08/06/13	1
n-Propylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Styrene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1,1,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1,2,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
Tetrachloroethene	BDL	0.0010	mg/l	8260B	08/06/13	1
Toluene	BDL	0.0050	mg/l	8260B	08/06/13	1
1,2,3-Trichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,2,4-Trichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1,1-Trichloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1,2-Trichloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
Trichloroethene	BDL	0.0010	mg/l	8260B	08/06/13	1
Trichlorofluoromethane	BDL	0.0050	mg/l	8260B	08/06/13	1
1,2,3-Trichloropropane	BDL	0.0025	mg/l	8260B	08/06/13	1
1,2,4-Trimethylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,3,5-Trimethylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Vinyl chloride	BDL	0.0010	mg/l	8260B	08/06/13	1
Xylenes, Total	BDL	0.0030	mg/l	8260B	08/06/13	1
Surrogate Recovery						
Toluene-d8	105.		% Rec.	8260B	08/06/13	1
Dibromofluoromethane	105.		% Rec.	8260B	08/06/13	1
a,a,a-Trifluorotoluene	106.		% Rec.	8260B	08/06/13	1
4-Bromofluorobenzene	105.		% Rec.	8260B	08/06/13	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(b)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(g,h,i)perylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(k)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Chrysene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Dibenz(a,h)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluorene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Naphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Phenanthrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-06

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : MW-03

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
1-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
2-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
2-Chloronaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Surrogate Recovery						
Nitrobenzene-d5	84.6		% Rec.	8270 C-SIM	08/08/13	1
2-Fluorobiphenyl	82.4		% Rec.	8270 C-SIM	08/08/13	1
p-Terphenyl-d14	79.0		% Rec.	8270 C-SIM	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-07

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : MW-04

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	08/06/13	1
Toluene	BDL	0.0050	mg/l	8021	08/06/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021	08/06/13	1
Total Xylene	BDL	0.0015	mg/l	8021	08/06/13	1
Methyl tert-butyl ether	0.0049	0.0010	mg/l	8021	08/06/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	96.2		% Rec.	8021	08/06/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-08

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : MW-05

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Volatile Organics						
Acetone	BDL	0.050	mg/l	8260B	08/06/13	1
Acrylonitrile	BDL	0.010	mg/l	8260B	08/06/13	1
Benzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Bromobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Bromodichloromethane	BDL	0.0010	mg/l	8260B	08/06/13	1
Bromoform	BDL	0.0010	mg/l	8260B	08/06/13	1
Bromomethane	BDL	0.0050	mg/l	8260B	08/06/13	1
n-Butylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
sec-Butylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
tert-Butylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Carbon tetrachloride	BDL	0.0010	mg/l	8260B	08/06/13	1
Chlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Chlorodibromomethane	BDL	0.0010	mg/l	8260B	08/06/13	1
Chloroethane	BDL	0.0050	mg/l	8260B	08/06/13	1
2-Chloroethyl vinyl ether	BDL	0.050	mg/l	8260B	08/06/13	1
Chloroform	BDL	0.0050	mg/l	8260B	08/06/13	1
Chloromethane	BDL	0.0025	mg/l	8260B	08/06/13	1
2-Chlorotoluene	BDL	0.0010	mg/l	8260B	08/06/13	1
4-Chlorotoluene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,2-Dibromo-3-Chloropropane	BDL	0.0050	mg/l	8260B	08/06/13	1
1,2-Dibromoethane	BDL	0.0010	mg/l	8260B	08/06/13	1
Dibromomethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,2-Dichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,3-Dichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,4-Dichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Dichlorodifluoromethane	BDL	0.0050	mg/l	8260B	08/06/13	1
1,1-Dichloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,2-Dichloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1-Dichloroethene	BDL	0.0010	mg/l	8260B	08/06/13	1
cis-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	08/06/13	1
trans-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,2-Dichloropropane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1-Dichloropropene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,3-Dichloropropane	BDL	0.0010	mg/l	8260B	08/06/13	1
cis-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	08/06/13	1
trans-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	08/06/13	1
2,2-Dichloropropane	BDL	0.0010	mg/l	8260B	08/06/13	1
Di-isopropyl ether	BDL	0.0010	mg/l	8260B	08/06/13	1
Ethylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Hexachloro-1,3-butadiene	BDL	0.0010	mg/l	8260B	08/06/13	1
n-Hexane	BDL	0.010	mg/l	8260B	08/06/13	1
Isopropylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
p-Isopropyltoluene	BDL	0.0010	mg/l	8260B	08/06/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-08

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : MW-05

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
2-Butanone (MEK)	BDL	0.010	mg/l	8260B	08/06/13	1
Methylene Chloride	BDL	0.0050	mg/l	8260B	08/06/13	1
4-Methyl-2-pentanone (MIBK)	BDL	0.010	mg/l	8260B	08/06/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/l	8260B	08/06/13	1
Naphthalene	BDL	0.0050	mg/l	8260B	08/06/13	1
n-Propylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Styrene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1,1,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1,2,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
Tetrachloroethene	BDL	0.0010	mg/l	8260B	08/06/13	1
Toluene	BDL	0.0050	mg/l	8260B	08/06/13	1
1,2,3-Trichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,2,4-Trichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1,1-Trichloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1,2-Trichloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
Trichloroethene	BDL	0.0010	mg/l	8260B	08/06/13	1
Trichlorofluoromethane	BDL	0.0050	mg/l	8260B	08/06/13	1
1,2,3-Trichloropropane	BDL	0.0025	mg/l	8260B	08/06/13	1
1,2,4-Trimethylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,3,5-Trimethylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Vinyl chloride	BDL	0.0010	mg/l	8260B	08/06/13	1
Xylenes, Total	BDL	0.0030	mg/l	8260B	08/06/13	1
Surrogate Recovery						
Toluene-d8	105.		% Rec.	8260B	08/06/13	1
Dibromofluoromethane	106.		% Rec.	8260B	08/06/13	1
a,a,a-Trifluorotoluene	105.		% Rec.	8260B	08/06/13	1
4-Bromofluorobenzene	106.		% Rec.	8260B	08/06/13	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(b)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(g,h,i)perylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(k)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Chrysene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Dibenz(a,h)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluoranthene	0.000069	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluorene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Naphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Phenanthrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-08

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : MW-05

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Pyrene	0.000050	0.000050	mg/l	8270 C-SIM	08/08/13	1
1-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
2-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
2-Chloronaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Surrogate Recovery						
Nitrobenzene-d5	61.1		% Rec.	8270 C-SIM	08/08/13	1
2-Fluorobiphenyl	64.0		% Rec.	8270 C-SIM	08/08/13	1
p-Terphenyl-d14	62.4		% Rec.	8270 C-SIM	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-09

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : MW-06

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	08/06/13	1
Toluene	BDL	0.0050	mg/l	8021	08/06/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021	08/06/13	1
Total Xylene	BDL	0.0015	mg/l	8021	08/06/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/l	8021	08/06/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	95.9		% Rec.	8021	08/06/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-10

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : FB080213

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(b)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(g,h,i)perylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(k)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Chrysene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Dibenz(a,h)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluorene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Naphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Phenanthrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
1-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
2-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
2-Chloronaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Surrogate Recovery						
Nitrobenzene-d5	73.2		% Rec.	8270 C-SIM	08/08/13	1
2-Fluorobiphenyl	81.5		% Rec.	8270 C-SIM	08/08/13	1
p-Terphenyl-d14	82.0		% Rec.	8270 C-SIM	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-11

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : EB080213

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	08/06/13	1
Toluene	BDL	0.0050	mg/l	8021	08/06/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021	08/06/13	1
Total Xylene	BDL	0.0015	mg/l	8021	08/06/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/l	8021	08/06/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	96.2		% Rec.	8021	08/06/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
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August 14, 2013

ESC Sample # : L650036-12

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : DUP080213

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	08/08/13	1
Toluene	BDL	0.0050	mg/l	8021	08/08/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021	08/08/13	1
Total Xylene	BDL	0.0015	mg/l	8021	08/08/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/l	8021	08/08/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	99.6		% Rec.	8021	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-13

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : TB80213

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	08/08/13	1
Toluene	BDL	0.0050	mg/l	8021	08/08/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021	08/08/13	1
Total Xylene	BDL	0.0015	mg/l	8021	08/08/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/l	8021	08/08/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-15

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : MW-01 4-6FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	84.5	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	24.	5.9	mg/kg	8015	08/08/13	50
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.2		% Rec.	8015	08/08/13	50
Benzene	0.41	0.24	mg/kg	8260B	08/07/13	200
Toluene	2.4	1.2	mg/kg	8260B	08/07/13	200
Ethylbenzene	11.	0.24	mg/kg	8260B	08/07/13	200
Total Xylenes	54.	0.71	mg/kg	8260B	08/07/13	200
Methyl tert-butyl ether	BDL	0.24	mg/kg	8260B	08/07/13	200
Surrogate Recovery						
Toluene-d8	99.8		% Rec.	8260B	08/07/13	200
Dibromofluoromethane	100.		% Rec.	8260B	08/07/13	200
4-Bromofluorobenzene	101.		% Rec.	8260B	08/07/13	200
Ohio DRO						
C10-C20 Hydrocarbons	45.	4.7	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	4.7	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	81.5		% Rec.	8015M	08/09/13	1

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-16

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : MW-02 2-4FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	79.5	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	BDL	0.63	mg/kg	8015	08/07/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.6		% Rec.	8015	08/07/13	5
Benzene	BDL	0.0063	mg/kg	8260B	08/06/13	5
Toluene	BDL	0.031	mg/kg	8260B	08/06/13	5
Ethylbenzene	BDL	0.0063	mg/kg	8260B	08/06/13	5
Total Xylenes	BDL	0.019	mg/kg	8260B	08/06/13	5
Methyl tert-butyl ether	BDL	0.0063	mg/kg	8260B	08/06/13	5
Surrogate Recovery						
Toluene-d8	96.4		% Rec.	8260B	08/06/13	5
Dibromofluoromethane	92.9		% Rec.	8260B	08/06/13	5
4-Bromofluorobenzene	98.2		% Rec.	8260B	08/06/13	5
Ohio DRO						
C10-C20 Hydrocarbons	BDL	5.0	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	5.0	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	80.2		% Rec.	8015M	08/09/13	1

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

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The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-17

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : MW-03 6-8FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	76.4	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	BDL	0.65	mg/kg	8015	08/07/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.7		% Rec.	8015	08/07/13	5
Volatile Organics						
Acetone	BDL	0.33	mg/kg	8260B	08/06/13	5
Acrylonitrile	BDL	0.065	mg/kg	8260B	08/06/13	5
Benzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Bromobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Bromodichloromethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
Bromoform	BDL	0.0065	mg/kg	8260B	08/06/13	5
Bromomethane	BDL	0.033	mg/kg	8260B	08/06/13	5
n-Butylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
sec-Butylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
tert-Butylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Carbon tetrachloride	BDL	0.0065	mg/kg	8260B	08/06/13	5
Chlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Chlorodibromomethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
Chloroethane	BDL	0.033	mg/kg	8260B	08/06/13	5
2-Chloroethyl vinyl ether	BDL	0.33	mg/kg	8260B	08/06/13	5
Chloroform	BDL	0.033	mg/kg	8260B	08/06/13	5
Chloromethane	BDL	0.016	mg/kg	8260B	08/06/13	5
2-Chlorotoluene	BDL	0.0065	mg/kg	8260B	08/06/13	5
4-Chlorotoluene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2-Dibromo-3-Chloropropane	BDL	0.033	mg/kg	8260B	08/06/13	5
1,2-Dibromoethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
Dibromomethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2-Dichlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,3-Dichlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,4-Dichlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Dichlorodifluoromethane	BDL	0.033	mg/kg	8260B	08/06/13	5
1,1-Dichloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2-Dichloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1-Dichloroethene	BDL	0.0065	mg/kg	8260B	08/06/13	5
cis-1,2-Dichloroethene	BDL	0.0065	mg/kg	8260B	08/06/13	5
trans-1,2-Dichloroethene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2-Dichloropropane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1-Dichloropropene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,3-Dichloropropane	BDL	0.0065	mg/kg	8260B	08/06/13	5
cis-1,3-Dichloropropene	BDL	0.0065	mg/kg	8260B	08/06/13	5
trans-1,3-Dichloropropene	BDL	0.0065	mg/kg	8260B	08/06/13	5
2,2-Dichloropropane	BDL	0.0065	mg/kg	8260B	08/06/13	5

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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Est. 1970

REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-17

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : MW-03 6-8FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Di-isopropyl ether	BDL	0.0065	mg/kg	8260B	08/06/13	5
Ethylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Hexachloro-1,3-butadiene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Isopropylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
p-Isopropyltoluene	BDL	0.0065	mg/kg	8260B	08/06/13	5
2-Butanone (MEK)	BDL	0.065	mg/kg	8260B	08/06/13	5
Methylene Chloride	BDL	0.033	mg/kg	8260B	08/06/13	5
4-Methyl-2-pentanone (MIBK)	BDL	0.065	mg/kg	8260B	08/06/13	5
Methyl tert-butyl ether	BDL	0.0065	mg/kg	8260B	08/06/13	5
Naphthalene	BDL	0.033	mg/kg	8260B	08/06/13	5
n-Propylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Styrene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1,1,2-Tetrachloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1,2,2-Tetrachloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1,2-Trichlorotrifluoroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
Tetrachloroethene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Toluene	BDL	0.033	mg/kg	8260B	08/06/13	5
1,2,3-Trichlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2,4-Trichlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1,1-Trichloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1,2-Trichloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
Trichloroethene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Trichlorofluoromethane	BDL	0.033	mg/kg	8260B	08/06/13	5
1,2,3-Trichloropropane	BDL	0.016	mg/kg	8260B	08/06/13	5
1,2,4-Trimethylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2,3-Trimethylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Vinyl chloride	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,3,5-Trimethylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Xylenes, Total	BDL	0.020	mg/kg	8260B	08/06/13	5
Surrogate Recovery						
Toluene-d8	96.4		% Rec.	8260B	08/06/13	5
Dibromofluoromethane	92.0		% Rec.	8260B	08/06/13	5
4-Bromofluorobenzene	99.9		% Rec.	8260B	08/06/13	5
Ohio DRO						
C10-C20 Hydrocarbons	BDL	5.2	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	5.2	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	73.3		% Rec.	8015M	08/09/13	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.043	mg/kg	8270C	08/07/13	1
Acenaphthene	BDL	0.043	mg/kg	8270C	08/07/13	1
Acenaphthylene	BDL	0.043	mg/kg	8270C	08/07/13	1

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-17

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : MW-03 6-8FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)anthracene	BDL	0.043	mg/kg	8270C	08/07/13	1
Benzo(a)pyrene	BDL	0.043	mg/kg	8270C	08/07/13	1
Benzo(b)fluoranthene	BDL	0.043	mg/kg	8270C	08/07/13	1
Benzo(g,h,i)perylene	BDL	0.043	mg/kg	8270C	08/07/13	1
Benzo(k)fluoranthene	BDL	0.043	mg/kg	8270C	08/07/13	1
Chrysene	BDL	0.043	mg/kg	8270C	08/07/13	1
Dibenz(a,h)anthracene	BDL	0.043	mg/kg	8270C	08/07/13	1
Fluoranthene	BDL	0.043	mg/kg	8270C	08/07/13	1
Fluorene	BDL	0.043	mg/kg	8270C	08/07/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.043	mg/kg	8270C	08/07/13	1
Naphthalene	BDL	0.043	mg/kg	8270C	08/07/13	1
Phenanthrene	BDL	0.043	mg/kg	8270C	08/07/13	1
Pyrene	BDL	0.043	mg/kg	8270C	08/07/13	1
Surrogate Recovery						
Nitrobenzene-d5	115.		% Rec.	8270C	08/07/13	1
2-Fluorobiphenyl	111.		% Rec.	8270C	08/07/13	1
p-Terphenyl-d14	82.4		% Rec.	8270C	08/07/13	1
Polychlorinated Biphenyls						
PCB 1016	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1221	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1232	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1242	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1248	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1254	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1260	BDL	0.022	mg/kg	8082	08/06/13	1
PCBs Surrogates						
Decachlorobiphenyl	71.8		% Rec.	8082	08/06/13	1
Tetrachloro-m-xylene	92.2		% Rec.	8082	08/06/13	1

Results listed are dry weight basis.
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Det. Limit - Practical Quantitation Limit(PQL)
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Reported: 08/09/13 16:39 Revised: 08/14/13 11:10

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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-18

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : MW-04 10-12FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	87.0	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	BDL	0.57	mg/kg	8015	08/07/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.0		% Rec.	8015	08/07/13	5
Benzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Toluene	BDL	0.029	mg/kg	8260B	08/06/13	5
Ethylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Total Xylenes	BDL	0.017	mg/kg	8260B	08/06/13	5
Methyl tert-butyl ether	BDL	0.0057	mg/kg	8260B	08/06/13	5
Surrogate Recovery						
Toluene-d8	95.7		% Rec.	8260B	08/06/13	5
Dibromofluoromethane	93.3		% Rec.	8260B	08/06/13	5
4-Bromofluorobenzene	95.9		% Rec.	8260B	08/06/13	5
Ohio DRO						
C10-C20 Hydrocarbons	BDL	4.6	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	4.6	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	82.4		% Rec.	8015M	08/09/13	1

Results listed are dry weight basis.
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-19

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : MW-05 22-24FT

Project # : C3210006

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	88.3	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	BDL	0.57	mg/kg	8015	08/07/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.5		% Rec.	8015	08/07/13	5
Volatile Organics						
Acetone	BDL	0.28	mg/kg	8260B	08/06/13	5
Acrylonitrile	BDL	0.057	mg/kg	8260B	08/06/13	5
Benzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Bromobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Bromodichloromethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
Bromoform	BDL	0.0057	mg/kg	8260B	08/06/13	5
Bromomethane	BDL	0.028	mg/kg	8260B	08/06/13	5
n-Butylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
sec-Butylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
tert-Butylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Carbon tetrachloride	BDL	0.0057	mg/kg	8260B	08/06/13	5
Chlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Chlorodibromomethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
Chloroethane	BDL	0.028	mg/kg	8260B	08/06/13	5
2-Chloroethyl vinyl ether	BDL	0.28	mg/kg	8260B	08/06/13	5
Chloroform	BDL	0.028	mg/kg	8260B	08/06/13	5
Chloromethane	BDL	0.014	mg/kg	8260B	08/06/13	5
2-Chlorotoluene	BDL	0.0057	mg/kg	8260B	08/06/13	5
4-Chlorotoluene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2-Dibromo-3-Chloropropane	BDL	0.028	mg/kg	8260B	08/06/13	5
1,2-Dibromoethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
Dibromomethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2-Dichlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,3-Dichlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,4-Dichlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Dichlorodifluoromethane	BDL	0.028	mg/kg	8260B	08/06/13	5
1,1-Dichloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2-Dichloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1-Dichloroethene	BDL	0.0057	mg/kg	8260B	08/06/13	5
cis-1,2-Dichloroethene	BDL	0.0057	mg/kg	8260B	08/06/13	5
trans-1,2-Dichloroethene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2-Dichloropropane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1-Dichloropropene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,3-Dichloropropane	BDL	0.0057	mg/kg	8260B	08/06/13	5
cis-1,3-Dichloropropene	BDL	0.0057	mg/kg	8260B	08/06/13	5
trans-1,3-Dichloropropene	BDL	0.0057	mg/kg	8260B	08/06/13	5
2,2-Dichloropropane	BDL	0.0057	mg/kg	8260B	08/06/13	5

Results listed are dry weight basis.
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-19

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : MW-05 22-24FT

Project # : C3210006

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Di-isopropyl ether	BDL	0.0057	mg/kg	8260B	08/06/13	5
Ethylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Hexachloro-1,3-butadiene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Isopropylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
p-Isopropyltoluene	BDL	0.0057	mg/kg	8260B	08/06/13	5
2-Butanone (MEK)	BDL	0.057	mg/kg	8260B	08/06/13	5
Methylene Chloride	BDL	0.028	mg/kg	8260B	08/06/13	5
4-Methyl-2-pentanone (MIBK)	BDL	0.057	mg/kg	8260B	08/06/13	5
Methyl tert-butyl ether	BDL	0.0057	mg/kg	8260B	08/06/13	5
Naphthalene	BDL	0.028	mg/kg	8260B	08/06/13	5
n-Propylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Styrene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1,1,2-Tetrachloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1,2,2-Tetrachloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1,2-Trichlorotrifluoroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
Tetrachloroethene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Toluene	BDL	0.028	mg/kg	8260B	08/06/13	5
1,2,3-Trichlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2,4-Trichlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1,1-Trichloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1,2-Trichloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
Trichloroethene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Trichlorofluoromethane	BDL	0.028	mg/kg	8260B	08/06/13	5
1,2,3-Trichloropropane	BDL	0.014	mg/kg	8260B	08/06/13	5
1,2,4-Trimethylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2,3-Trimethylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Vinyl chloride	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,3,5-Trimethylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Xylenes, Total	BDL	0.017	mg/kg	8260B	08/06/13	5
Surrogate Recovery						
Toluene-d8	96.3		% Rec.	8260B	08/06/13	5
Dibromofluoromethane	93.8		% Rec.	8260B	08/06/13	5
4-Bromofluorobenzene	96.1		% Rec.	8260B	08/06/13	5
Ohio DRO						
C10-C20 Hydrocarbons	BDL	4.5	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	4.5	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	84.6		% Rec.	8015M	08/09/13	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.037	mg/kg	8270C	08/07/13	1
Acenaphthene	BDL	0.037	mg/kg	8270C	08/07/13	1
Acenaphthylene	BDL	0.037	mg/kg	8270C	08/07/13	1

Results listed are dry weight basis.
BDL - Below Detection Limit
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-19

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : MW-05 22-24FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)anthracene	BDL	0.037	mg/kg	8270C	08/07/13	1
Benzo(a)pyrene	BDL	0.037	mg/kg	8270C	08/07/13	1
Benzo(b)fluoranthene	BDL	0.037	mg/kg	8270C	08/07/13	1
Benzo(g,h,i)perylene	BDL	0.037	mg/kg	8270C	08/07/13	1
Benzo(k)fluoranthene	BDL	0.037	mg/kg	8270C	08/07/13	1
Chrysene	BDL	0.037	mg/kg	8270C	08/07/13	1
Dibenz(a,h)anthracene	BDL	0.037	mg/kg	8270C	08/07/13	1
Fluoranthene	BDL	0.037	mg/kg	8270C	08/07/13	1
Fluorene	BDL	0.037	mg/kg	8270C	08/07/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.037	mg/kg	8270C	08/07/13	1
Naphthalene	BDL	0.037	mg/kg	8270C	08/07/13	1
Phenanthrene	BDL	0.037	mg/kg	8270C	08/07/13	1
Pyrene	BDL	0.037	mg/kg	8270C	08/07/13	1
Surrogate Recovery						
Nitrobenzene-d5	119.		% Rec.	8270C	08/07/13	1
2-Fluorobiphenyl	108.		% Rec.	8270C	08/07/13	1
p-Terphenyl-d14	108.		% Rec.	8270C	08/07/13	1
Polychlorinated Biphenyls						
PCB 1016	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1221	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1232	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1242	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1248	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1254	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1260	BDL	0.019	mg/kg	8082	08/06/13	1
PCBs Surrogates						
Decachlorobiphenyl	73.8		% Rec.	8082	08/06/13	1
Tetrachloro-m-xylene	88.0		% Rec.	8082	08/06/13	1

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-20

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : MW-06 8-10FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	85.9	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	BDL	0.58	mg/kg	8015	08/07/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.1		% Rec.	8015	08/07/13	5
Benzene	BDL	0.0058	mg/kg	8260B	08/06/13	5
Toluene	BDL	0.029	mg/kg	8260B	08/06/13	5
Ethylbenzene	BDL	0.0058	mg/kg	8260B	08/06/13	5
Total Xylenes	BDL	0.017	mg/kg	8260B	08/06/13	5
Methyl tert-butyl ether	BDL	0.0058	mg/kg	8260B	08/06/13	5
Surrogate Recovery						
Toluene-d8	96.0		% Rec.	8260B	08/06/13	5
Dibromofluoromethane	92.3		% Rec.	8260B	08/06/13	5
4-Bromofluorobenzene	97.3		% Rec.	8260B	08/06/13	5
Ohio DRO						
C10-C20 Hydrocarbons	BDL	4.6	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	4.6	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	83.2		% Rec.	8015M	08/09/13	1

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-21

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : B-07 4-6FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	83.9	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	100	60.	mg/kg	8015	08/07/13	500
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.2		% Rec.	8015	08/07/13	500
Benzene	0.39	0.060	mg/kg	8260B	08/07/13	50
Toluene	BDL	0.30	mg/kg	8260B	08/07/13	50
Ethylbenzene	3.1	0.060	mg/kg	8260B	08/07/13	50
Total Xylenes	7.6	0.18	mg/kg	8260B	08/07/13	50
Methyl tert-butyl ether	BDL	0.060	mg/kg	8260B	08/07/13	50
Surrogate Recovery						
Toluene-d8	97.5		% Rec.	8260B	08/07/13	50
Dibromofluoromethane	99.0		% Rec.	8260B	08/07/13	50
4-Bromofluorobenzene	98.3		% Rec.	8260B	08/07/13	50
Ohio DRO						
C10-C20 Hydrocarbons	17.	4.8	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	4.8	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	83.0		% Rec.	8015M	08/09/13	1

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-22

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : B-08 4-6FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	81.2	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	8.0	0.62	mg/kg	8015	08/07/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.4		% Rec.	8015	08/07/13	5
Benzene	0.018	0.0062	mg/kg	8260B	08/06/13	5
Toluene	BDL	0.031	mg/kg	8260B	08/06/13	5
Ethylbenzene	0.22	0.0062	mg/kg	8260B	08/06/13	5
Total Xylenes	0.28	0.018	mg/kg	8260B	08/06/13	5
Methyl tert-butyl ether	BDL	0.0062	mg/kg	8260B	08/06/13	5
Surrogate Recovery						
Toluene-d8	97.3		% Rec.	8260B	08/06/13	5
Dibromofluoromethane	93.8		% Rec.	8260B	08/06/13	5
4-Bromofluorobenzene	101.		% Rec.	8260B	08/06/13	5
Ohio DRO						
C10-C20 Hydrocarbons	8.4	4.9	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	4.9	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	80.3		% Rec.	8015M	08/09/13	1

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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-23

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : B-09 6-8FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	84.7	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	450	5.9	mg/kg	8015	08/08/13	50
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.7		% Rec.	8015	08/08/13	50
Volatile Organics						
Acetone	BDL	0.30	mg/kg	8260B	08/06/13	5
Acrylonitrile	BDL	0.059	mg/kg	8260B	08/06/13	5
Benzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Bromobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Bromodichloromethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
Bromoform	BDL	0.0059	mg/kg	8260B	08/06/13	5
Bromomethane	BDL	0.030	mg/kg	8260B	08/06/13	5
n-Butylbenzene	0.051	0.0059	mg/kg	8260B	08/06/13	5
sec-Butylbenzene	0.020	0.0059	mg/kg	8260B	08/06/13	5
tert-Butylbenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Carbon tetrachloride	BDL	0.0059	mg/kg	8260B	08/06/13	5
Chlorobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Chlorodibromomethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
Chloroethane	BDL	0.030	mg/kg	8260B	08/06/13	5
2-Chloroethyl vinyl ether	BDL	0.30	mg/kg	8260B	08/06/13	5
Chloroform	BDL	0.030	mg/kg	8260B	08/06/13	5
Chloromethane	BDL	0.015	mg/kg	8260B	08/06/13	5
2-Chlorotoluene	BDL	0.0059	mg/kg	8260B	08/06/13	5
4-Chlorotoluene	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,2-Dibromo-3-Chloropropane	BDL	0.030	mg/kg	8260B	08/06/13	5
1,2-Dibromoethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
Dibromomethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,2-Dichlorobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,3-Dichlorobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,4-Dichlorobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Dichlorodifluoromethane	BDL	0.030	mg/kg	8260B	08/06/13	5
1,1-Dichloroethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,2-Dichloroethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,1-Dichloroethene	BDL	0.0059	mg/kg	8260B	08/06/13	5
cis-1,2-Dichloroethene	BDL	0.0059	mg/kg	8260B	08/06/13	5
trans-1,2-Dichloroethene	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,2-Dichloropropane	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,1-Dichloropropene	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,3-Dichloropropane	BDL	0.0059	mg/kg	8260B	08/06/13	5
cis-1,3-Dichloropropene	BDL	0.0059	mg/kg	8260B	08/06/13	5
trans-1,3-Dichloropropene	BDL	0.0059	mg/kg	8260B	08/06/13	5
2,2-Dichloropropane	BDL	0.0059	mg/kg	8260B	08/06/13	5

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BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-23

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : B-09 6-8FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Di-isopropyl ether	BDL	0.0059	mg/kg	8260B	08/06/13	5
Ethylbenzene	0.021	0.0059	mg/kg	8260B	08/06/13	5
Hexachloro-1,3-butadiene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Isopropylbenzene	0.015	0.0059	mg/kg	8260B	08/06/13	5
p-Isopropyltoluene	0.010	0.0059	mg/kg	8260B	08/06/13	5
2-Butanone (MEK)	BDL	0.059	mg/kg	8260B	08/06/13	5
Methylene Chloride	BDL	0.030	mg/kg	8260B	08/06/13	5
4-Methyl-2-pentanone (MIBK)	BDL	0.059	mg/kg	8260B	08/06/13	5
Methyl tert-butyl ether	BDL	0.0059	mg/kg	8260B	08/06/13	5
Naphthalene	0.067	0.030	mg/kg	8260B	08/06/13	5
n-Propylbenzene	0.060	0.0059	mg/kg	8260B	08/06/13	5
Styrene	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,1,1,2-Tetrachloroethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,1,2,2-Tetrachloroethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,1,2-Trichlorotrifluoroethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
Tetrachloroethene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Toluene	BDL	0.030	mg/kg	8260B	08/06/13	5
1,2,3-Trichlorobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,2,4-Trichlorobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,1,1-Trichloroethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,1,2-Trichloroethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
Trichloroethene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Trichlorofluoromethane	BDL	0.030	mg/kg	8260B	08/06/13	5
1,2,3-Trichloropropane	BDL	0.015	mg/kg	8260B	08/06/13	5
1,2,4-Trimethylbenzene	0.28	0.0059	mg/kg	8260B	08/06/13	5
1,2,3-Trimethylbenzene	0.059	0.0059	mg/kg	8260B	08/06/13	5
Vinyl chloride	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,3,5-Trimethylbenzene	0.031	0.0059	mg/kg	8260B	08/06/13	5
Xylenes, Total	0.024	0.018	mg/kg	8260B	08/06/13	5
Surrogate Recovery						
Toluene-d8	57.9		% Rec.	8260B	08/06/13	5
Dibromofluoromethane	93.1		% Rec.	8260B	08/06/13	5
4-Bromofluorobenzene	114.		% Rec.	8260B	08/06/13	5
Ohio DRO						
C10-C20 Hydrocarbons	4.8	4.7	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	4.7	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	75.4		% Rec.	8015M	08/09/13	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.039	mg/kg	8270C	08/07/13	1
Acenaphthene	BDL	0.039	mg/kg	8270C	08/07/13	1
Acenaphthylene	BDL	0.039	mg/kg	8270C	08/07/13	1

Results listed are dry weight basis.
BDL - Below Detection Limit
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-23

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : B-09 6-8FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)anthracene	BDL	0.039	mg/kg	8270C	08/07/13	1
Benzo(a)pyrene	BDL	0.039	mg/kg	8270C	08/07/13	1
Benzo(b)fluoranthene	BDL	0.039	mg/kg	8270C	08/07/13	1
Benzo(g,h,i)perylene	BDL	0.039	mg/kg	8270C	08/07/13	1
Benzo(k)fluoranthene	BDL	0.039	mg/kg	8270C	08/07/13	1
Chrysene	BDL	0.039	mg/kg	8270C	08/07/13	1
Dibenz(a,h)anthracene	BDL	0.039	mg/kg	8270C	08/07/13	1
Fluoranthene	BDL	0.039	mg/kg	8270C	08/07/13	1
Fluorene	BDL	0.039	mg/kg	8270C	08/07/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.039	mg/kg	8270C	08/07/13	1
Naphthalene	0.38	0.039	mg/kg	8270C	08/07/13	1
Phenanthrene	BDL	0.039	mg/kg	8270C	08/07/13	1
Pyrene	BDL	0.039	mg/kg	8270C	08/07/13	1
Surrogate Recovery						
Nitrobenzene-d5	121.		% Rec.	8270C	08/07/13	1
2-Fluorobiphenyl	103.		% Rec.	8270C	08/07/13	1
p-Terphenyl-d14	102.		% Rec.	8270C	08/07/13	1
Polychlorinated Biphenyls						
PCB 1016	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1221	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1232	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1242	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1248	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1254	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1260	BDL	0.020	mg/kg	8082	08/06/13	1
PCBs Surrogates						
Decachlorobiphenyl	73.8		% Rec.	8082	08/06/13	1
Tetrachloro-m-xylene	84.1		% Rec.	8082	08/06/13	1

Results listed are dry weight basis.
BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Mr. Matt Danus
The Mannik and Smith Group, Inc.
23225 Mercantile Rd.
Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-24

Site ID :

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Sample ID : B-10 8-10FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	84.6	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	BDL	0.59	mg/kg	8015	08/09/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.2		% Rec.	8015	08/09/13	5
Benzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Toluene	BDL	0.030	mg/kg	8260B	08/06/13	5
Ethylbenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Total Xylenes	BDL	0.018	mg/kg	8260B	08/06/13	5
Methyl tert-butyl ether	BDL	0.0059	mg/kg	8260B	08/06/13	5
Surrogate Recovery						
Toluene-d8	97.2		% Rec.	8260B	08/06/13	5
Dibromofluoromethane	92.3		% Rec.	8260B	08/06/13	5
4-Bromofluorobenzene	97.6		% Rec.	8260B	08/06/13	5
Ohio DRO						
C10-C20 Hydrocarbons	BDL	4.7	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	4.7	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	81.8		% Rec.	8015M	08/09/13	1

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Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L650036-06	WG675595	SAMP	2-Chloroethyl vinyl ether	R2770420	J3
L650036-23	WG675535	SAMP	2-Chloroethyl vinyl ether	R2770362	J3
	WG675535	SAMP	2-Butanone (MEK)	R2770362	J5
	WG675535	SAMP	1,1,2-Trichloroethane	R2770362	J5
	WG675535	SAMP	1,2,4-Trimethylbenzene	R2770362	J6
	WG675535	SAMP	Toluene-d8	R2770362	J2

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Company Name/Address:
Mannik Smith Group
23225 Mercantile Road
Beachwood Ohio

Billing Information:
same

Report to: **Matt Danus**

Email To: **mdanus@manniksmithgroup.com**

Project Description: **North Royalton Phase II ESA**

City/State Collected: **North Royalton OH**

Phone: **2164018878**
Fax:

Client Project # **C3210006**

Lab Project #

Collected by (print): **Jamie B.**

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ✓No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 2 of 3

ESC LAB SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 650036
Table #
Acctnum:
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOCs	BTEX/MTBE	PAHs	Rem./Contaminant	Sample # (lab only)
DUP073113		SS				1		X			-01
EB 073113		OT				1			X		-02
FB 073113		OT				1			X		-03
MW-01		GW				2		X			-04
MW-02						2		X			-05
MW-03						4	X		X		-06
MW-04						2		X			-07
MW-05						4	X		X		-08
MW-06						2		X			-09

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Remarks: 5040 0629 4636

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	8-2-13	2:11pm	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
	8/2/13	1700	

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ____

Temp: 3.6 °C Bottles Received: 41

Date: 8/3/13 Time: 0930

Condition: F (lab use only)

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: NCF: YES

Company Name/Address:
Mannik Smith Group
23225 Mercantile Road
Beachwood Ohio

Billing Information:
same

Report to:
Matt Danus

Email To:
mdanus@manniksmithgroup.com

Project Description: **North Royalton Phase II ESA**

City/State Collected: **North Royalton OH**

Phone: **2164018878**
Fax:

Client Project # **C3210006**

Lab Project #

Collected by (print): **Jamie B.**

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ✓No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEX/MTBE	PAHs								Rem./Contaminant	Sample # (lab only)
FB 080213		OT				2		X									-10
EB 080213		OT				2	X										-11
DUP 080213		GW				2	X										-12
TB 080213		TripBlank				2	X										-13

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Remarks: 5040 0629 4636

Flow _____ Other _____

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	8-2-13	2:11pm	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
	8/2/13	1700	

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 3.6 °C Bottles Received: 41

Date: 8/3/13 Time: 0932

Condition: F (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF: YES

Chain of Custody Page 3 of 3

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 650036

Table #

Acctnum:
Template:
Prelogin:
TSR:
PB:

Shipped Via:

Chain of Custody Page 1 of 3

ESC LABS — YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 650032

Table # E098

Acctnum:

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Company Name/Address:
Mannik Smith Group
23225 Mercantile Road
Beachwood Ohio

Billing Information:
same

Report to:
Matt Danus

Email To:
mdanus@manniksmithgroup.com

Project Description: **North Royalton Phase II ESA**

City/State Collected: **North Royalton OH**

Phone: **2164018878**
Fax:

Client Project # **C3210006**

Lab Project #

Collected by (print): **Jamie B.**

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ✓No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOCs 8260	BTEX/MTBE 8260	PAHs 8270	TPH (C,M,H) 8015	PCBs 8081	Rem./Contaminant	Sample # (lab only)
MW-01 4-6		SS		7-31-13		1		X		X			-15
MW-02 2-4						1		X		X			-16
MW-03 6-8						2	X		X	X	X		-17
MW-04 10-12						1		X		X			-18
MW-05 22-24						1	X		X	X	X		-19
MW-06 8-10						1		X		X			-20
B-07 4-6						2		X		X			-21
B-08 4-6						2		X		X			-22
B-09 6-8						3	X		X	X	X		-23
B-10 8-10						1		X		X			-24

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Flow _____ Other _____

Remarks: 5040 0629 4636

Hold #

Condition: F (lab use only)

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	8-2-13	2:11pm	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
	8/2/13	1700	

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 3.6 °C Bottles Received: 41

Date: 8/3/13 Time: 0930

COC Seal Intact: ✓Y ___N ___NA

pH Checked: NCF: YES

APPENDIX D
WELL DEVELOPMENT & SAMPLING FORMS

Well Development Data Log

Well ID

MW-01

Project Information

Project #: C321006 **Date:** August 1, 2013

Site Name: North Royalton, Vacant Gas Station **Telephone #:**

MSG Personnel Present: JNB

Regulatory Observer(s): None

Weather Conditions: Sunny, Windy **Temperature °F:** 80

Field Instrumentation

Static Water Level Measurement: Heron H.01L

Immiscible Layer(s) Measurement: --

Measurement of Field Parameters: IQ / LaMotte / ExTech

Peristaltic Pump: --

Monitoring Well Data

Ground Surface Elev.:

Top of Casing Elev.:

Ground Water Elev.:

Hydraulic Location:

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: none **Well Diameter:** 1 inch

Monitoring Purpose:

Total Depth (from TOC): 27.53 (ft.) - **Static Water Level:** 13.87 (ft.)

= Height of Water Column: 13.66 (ft.)

Immiscible Layer(s) Present: No

Top of Layer: NA (ft.)

Bottom of Layer: NA (ft.)

Thickness: NA (ft.)

Immiscible Layer(s) Sampled: Not Applicable

Monitor Well Diameter	Volume/foot of Water	Height of Water Column	Volume of Water Column		Minimum Vol. to Purge (gal)
1 (in)	0.041 (gal) x	13.66 (ft)	= 0.56		

Monitoring Well Development Data

Purging Device: Bailer/Pump

Purging Start Time: 14:35

Purging Stop Time: 15:15

Total Gallons Purged: 5.00

Well Yield:

Sampling Device:

Time of Sampling: am/pm

Second Attempt: am/pm

Third Attempt: am/pm

Fourth Attempt: am/pm

Fifth Attempt: am/pm

Well Volumes	Time	Vol. Purged (gal)	Temperature (°F)	pH (S.U.)	Conductivity (µS/cm)	Turbidity (NTU)
Initial	2:35	0.50				Brown
1	2:40	1.00				Brown
2	2:45	1.50				Brown
3	2:50	2.50				Brown
4	3:00	3.00				ight Brown/Cloud
5	3:05	4.00				ight Brown/Cloud
6	3:10	4.50				ight Brown/Cloud
Final	3:15	5.00				

Comments

Form Completed By: Jamie Berardinelli

Well Development Data Log

Well ID

MW-02

Project Information

Project #: C3210006 **Date:** August 1, 2013

Site Name: North Royalton, Vacant Gas Station **Telephone #:**

MSG Personnel Present: JNB

Regulatory Observer(s): None

Weather Conditions: Sunny, Windy **Temperature °F:** 80

Field Instrumentation

Static Water Level Measurement: Heron H.01L

Immiscible Layer(s) Measurement: --

Measurement of Field Parameters: Hanna

Peristaltic Pump: --

Monitoring Well Data

Ground Surface Elev.:

Top of Casing Elev.:

Ground Water Elev.:

Hydraulic Location:

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: Excellent / none **Well Diameter:** 1 inch

Monitoring Purpose: VAP shallow groundwater investigation

Total Depth (from TOC): 27.43 (ft.) - **Static Water Level:** 11.59 (ft.)

= Height of Water Column: 15.84 (ft.)

Immiscible Layer(s) Present:

Top of Layer: (ft.)

Bottom of Layer: (ft.)

Thickness: (ft.)

Immiscible Layer(s) Sampled:

Monitor Well Diameter	Volume/foot of Water	Height of Water Column	Volume of Water Column		Minimum Vol. to Purge (gal)
1 (in)	0.041 (gal) x	15.84 (ft)	= 0.64		

Monitoring Well Development Data

Purging Device: Bailer/pump

Purging Start Time: 1:40pm

Purging Stop Time: 2:30pm

Total Gallons Purged: 5.00

Well Yield:

Sampling Device:

Time of Sampling: am/pm

Second Attempt: am/pm

Third Attempt: am/pm

Fourth Attempt: am/pm

Fifth Attempt: am/pm

Well Volumes	Time	Vol. Purged (gal)	Temperature (°C)	pH (S.U.)	Conductivity (µS/cm)	Turbidity (NTU)
Initial	1:45	0.50				Brown
1	1:50	1.00				Brown
2	1:55	1.50				Brown
3	2:00	2.00				ight Brown/Cloud
4	2:05	2.50				Cloudy
5	2:10	3.00				Clear
6	2:15	3.50				Clear
7	2:20	4.00				Clear
8	2:25	4.50				Clear
Final	2:30	5.00				Clear

Comments

Form Completed By: Jamie Berardinelli

Well Development Data Log

Well ID

MW-03

Project Information

Project #: C3210006 **Date:** August 1, 2013

Site Name: Strongsville **Telephone #:**

MSG Personnel Present: JNB

Regulatory Observer(s): None

Weather Conditions: Sunny, Windy **Temperature °F:** 80

Field Instrumentation

Static Water Level Measurement: Heron H.01L

Immiscible Layer(s) Measurement: --

Measurement of Field Parameters: Horiba

Peristaltic Pump: --

Monitoring Well Data

Ground Surface Elev.:

Top of Casing Elev.:

Ground Water Elev.:

Hydraulic Location:

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: None **Well Diameter:** 1 inch

Monitoring Purpose: Develop

Total Depth (from TOC): 27.23 (ft.) - **Static Water Level:** 13.51 (ft.)

= Height of Water Column: 13.74 (ft.)

Immiscible Layer(s) Present: No

Top of Layer: (ft.)

Bottom of Layer: (ft.)

Thickness: (ft.)

Immiscible Layer(s) Sampled:

Monitor Well Diameter	Volume/foot of Water	Height of Water Column	Volume of Water Column		Minimum Vol. to Purge (gal)
1 (in)	0.041 (gal) x	13.74 (ft)	= 0.56		
2 (in)	0.163(gal) x	(ft)	=		=

Monitoring Well Development Data

Purging Device: Bailer/pump

Purging Start Time: 11:35

Purging Stop Time: 12:15

Total Gallons Purged: 5.00

Well Yield:

Sampling Device:

Time of Sampling: am/pm

Second Attempt: am/pm

Third Attempt: am/pm

Fourth Attempt: am/pm

Fifth Attempt: am/pm

Well Volumes	Time	Vol. Purged (gal)	Temperature (°F)	pH (S.U.)	Conductivity (µS/cm)	Turbidity (NTU)
Initial	11:30	0.50				Brown
1	11:35	1.00				Brown
2	11:40	1.50				Brown
3	11:45	2.00				Brown
4	11:50	2.50				Brown
5	11:55	3.00				Light Brown
6	12:00	3.50				Cloudy
7	12:05	4.00				Cloudy
8	12:10	4.50				Cloudy
Final	12:15	5.00				Cloudy

Comments

Form Completed By: Jamie Berardinelli

Well Development Data Log

Well ID

MW-04

Project Information

Project #: C3210006 **Date:** August 1, 2013

Site Name: North Royalton, Vacant Gas Station **Telephone #:**

MSG Personnel Present: JNB

Regulatory Observer(s): None

Weather Conditions: Sunny **Temperature °F:** 70

Field Instrumentation

Static Water Level Measurement: Heron H.01L

Immiscible Layer(s) Measurement: --

Measurement of Field Parameters: IQ / LaMotte / ExTech

Peristaltic Pump: --

Monitoring Well Data

Ground Surface Elev.:

Top of Casing Elev.:

Ground Water Elev.:

Hydraulic Location:

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: None **Well Diameter:** 1 inch

Monitoring Purpose: Develop

Total Depth (from TOC): 27.25 (ft.) - **Static Water Level:** 12.58 (ft.)

= Height of Water Column: 14.67 (ft.)

Immiscible Layer(s) Present: No

Top of Layer: NA (ft.)

Bottom of Layer: NA (ft.)

Thickness: NA (ft.)

Immiscible Layer(s) Sampled: Not Applicable

Monitor Well Diameter	Volume/foot of Water	Height of Water Column		Volume of Water Column		Minimum Vol. to Purge (gal)
1 (in)	0.041 (gal) x	14.67	(ft) =	0.60		
2(in)	0.163(gal) x		(ft) =			

Monitoring Well Development Data

Purging Device: Bailer/pump

Purging Start Time: 10:30am

Purging Stop Time: 11:20

Total Gallons Purged: 5.00

Well Yield:

Sampling Device:

Time of Sampling: am/pm

Second Attempt: am/pm

Third Attempt: am/pm

Fourth Attempt: am/pm

Fifth Attempt: am/pm

Well Volumes	Time	Vol. Purged (gal)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)
Initial	10:30	0.50				Brown
1	10:35	1.00				ight Brown/Cloud
2	10:40	1.25				ight Brown/Cloud
3	10:45	1.50				ight Brown/Cloud
4	10:50	2.00				ight Brown/Cloud
5	10:55	2.50				ight Brown/Cloud
6	11:00	3.00				ight Brown/Cloud
7	11:05	3.50				ight Brown/Cloud
8	11:10	4.00				ight Brown/Cloud
9	11:15	4.50				ight Brown/Cloud
Final	11:20	5.00				ight Brown/Cloud

Comments

Form Completed By: Jamie Berardinelli

Well Development Data Log

Well ID

MW-05

Project Information

Project #: C3210006 **Date:** August 1, 2013

Site Name: North Royalton, Vacant Gas Station **Telephone #:**

MSG Personnel Present: JNB

Regulatory Observer(s): None

Weather Conditions: Cloudy **Temperature °F:** 68

Field Instrumentation

Static Water Level Measurement: Heron H.01L

Immiscible Layer(s) Measurement: --

Measurement of Field Parameters: IQ / LaMotte / ExTech

Peristaltic Pump: --

Monitoring Well Data

Ground Surface Elev.:

Top of Casing Elev.:

Ground Water Elev.:

Hydraulic Location:

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: none **Well Diameter:** 1 inch

Monitoring Purpose: Develop

Total Depth (from TOC): 26.73 (ft.) - **Static Water Level:** 14.37 (ft.)

= Height of Water Column: 12.36 (ft.)

Immiscible Layer(s) Present: No

Top of Layer: NA (ft.)

Bottom of Layer: NA (ft.)

Thickness: NA (ft.)

Immiscible Layer(s) Sampled: Not Applicable

Monitor Well Diameter	Volume/foot of Water	Height of Water Column		Volume of Water Column		Minimum Vol. to Purge (gal)
1 (in)	0.041 (gal) x	12.36	(ft) =	0.50		
2(in)	0.163 (gal) x		(ft) =			

Monitoring Well Development Data

Purging Device: Bailer/pump

Purging Start Time: 9:30

Purging Stop Time: 10:15

Total Gallons Purged: 4.50

Well Yield:

Sampling Device:

Time of Sampling: am/pm

Second Attempt: am/pm

Third Attempt: am/pm

Fourth Attempt: am/pm

Fifth Attempt: am/pm

Well Volumes	Time	Vol. Purged (gal)	Temperature (°F)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)
Initial	9:30	0.50				Brown
1	9:35	1.00				Brown
2	9:40	1.50				Brown
3	9:45	1.75				Brown
4	9:50	2.00				Brown
5	9:55	2.50				Brown
6	10:00	3.00				Cloudy
7	10:05	3.50				Cloudy
8	10:10	4.00				Clear
Final	10:15	4.50				Clear

Comments

Form Completed By: Jamie Berardinelli

Well Development Data Log

Well ID

MW-06

Project Information

Project #: C3210006 **Date:** August 1, 2013

Site Name: North Royalton, Vacant Gas Station **Telephone #:**

MSG Personnel Present: JNB

Regulatory Observer(s): None

Weather Conditions: Sunny. Windy **Temperature °F:** 80

Field Instrumentation

Static Water Level Measurement: Heron H.01L

Immiscible Layer(s) Measurement: --

Measurement of Field Parameters: Horiba

Peristaltic Pump: --

Monitoring Well Data

Ground Surface Elev.:

Top of Casing Elev.:

Ground Water Elev.:

Hydraulic Location:

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: none **Well Diameter:** 1in

Monitoring Purpose:

Total Depth (from TOC): 31.13 (ft.) - **Static Water Level:** 25.95 (ft.)

= Height of Water Column: 5.18 (ft.)

Immiscible Layer(s) Present: No

Top of Layer: NA (ft.)

Bottom of Layer: NA (ft.)

Thickness: NA (ft.)

Immiscible Layer(s) Sampled: Not Applicable

Monitor Well Diameter	Volume/foot of Water	Height of Water Column	Volume of Water Column		Minimum Vol. to Purge (gal)
1 (in)	0.041 (gal) x	5.18 (ft)	0.21	x3	=

Monitoring Well Development Data

Purging Device: Bailer/Pump

Purging Start Time: 15:40

Purging Stop Time: 16:15

Total Gallons Purged: 1.25

Well Yield:

Sampling Device:

Time of Sampling: am/pm

Second Attempt: am/pm

Third Attempt: am/pm

Fourth Attempt: am/pm

Fifth Attempt: am/pm

Well Volumes	Time	Vol. Purged (gal)	Temperature (°F)	pH (S.U.)	Conductivity (mS/cm)	Turbidity (NTU)
Initial	3:40					Brown/ Gray
1	3:45					Brown/ Gray
2	3:50					Brown/ Gray
3	3:55					Light Brown
4	4:00					Light Brown
5	4:05					Light Brown
Final	4:10					Clear

Comments

Form Completed By: Jamie Berardinelli

The Mannik & Smith Group

Well Sampling Data Log

Well ID

MW-01

Project Information

Project #: C3210006 **Date:** August 2, 2013

Site Name: North Royalton, Vacant Gas Station **Telephone #:**

MSG Personnel Present: JNB

Regulatory Observer(s): None

Weather Conditions: Sunny **Temperature °F:** 66

Field Instrumentation

Static Water Level Measurement: Heron H.01L

Immiscible Layer(s) Measurement: --

Measurement of Field Parameters: Horiba

Peristaltic Pump: Cole Parmer Masterflex E/S

Monitoring Well Data

Ground Surface Elev.:

Top of Casing Elev.:

Ground Water Elev.:

Hydraulic Location:

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: Excellent / none **Well Diameter:** 1 inch

Monitoring Purpose: VAP shallow groundwater investigation

Total Depth (from TOC): 27.53 (ft.) - **Static Water Level:** 14.05 (ft.)

= Height of Water Column: 13.48 (ft.)

Immiscible Layer(s) Present: No

Top of Layer: NA (ft.)

Bottom of Layer: NA (ft.)

Thickness: NA (ft.)

Immiscible Layer(s) Sampled: Not Applicable

Monitor Well Diameter	Volume/foot of Water	Height of Water Column	Volume of Water Column		
1 (in)	0.041 (gal) x	13.48 (ft)	= 0.55		
~~2 (in)~~	~~0.163 (gal) x~~	~~(ft)~~	=		
~~4 (in)~~	~~0.653 (gal) x~~	~~(ft)~~	=		

Monitoring Well Purging and Sampling Data

Purging Device: Pump

Purging Start Time: 10:40

Purging Stop Time: 11:00

Total Gallons Purged: 1.50

Well Yield:

Sampling Device: Bailer

Time of Sampling: 11:05

~~**Second Attempt:**~~ ~~am/pm~~

~~**Third Attempt:**~~ ~~am/pm~~

~~**Fourth Attempt:**~~ ~~am/pm~~

~~**Fifth Attempt:**~~ ~~am/pm~~

Flow Rate (mL/min)	Time	Water Leve (feet)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity NTU
240	10:40	15.86	19.80	7.03	3.660	Little Cloudy
125-150	10:50	15.96	21.70	6.24	3.800	Little Cloudy
	11:00	15.96				Clear

Sample Container Information

Sample ID	Parameter	Container	Container Size	No. of Containers	Preservative
MW-01	BTEX/MTBE	Amber	VOAs	2	HCL

Comments

Samples Shipped to: ESC Lab Science **Via:** Matt Danus

Form Completed By: Jamie Berardinelli

Well Sampling Data Log

Well ID

MW-02

Project Information

Project #: C3210006 **Date:** August 2, 2013

Site Name: North Royalton, Vacant Gas Station **Telephone #:**

MSG Personnel Present: JNB

Regulatory Observer(s): None

Weather Conditions: Sunny **Temperature °F:** 66

Field Instrumentation

Static Water Level Measurement: Heron H.01L

Immiscible Layer(s) Measurement: --

Measurement of Field Parameters: Horiba

Peristaltic Pump: Cole Parmer Masterflex E/S

Monitoring Well Data

Ground Surface Elev.:

Top of Casing Elev.:

Ground Water Elev.:

Hydraulic Location:

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: Excellent / none **Well Diameter:** 1 inch

Monitoring Purpose:

Total Depth (from TOC): 27.43 (ft.) - **Static Water Level:** 11.60 (ft.)

= Height of Water Column: 15.83 (ft.)

Immiscible Layer(s) Present: No

Top of Layer: NA (ft.)

Bottom of Layer: NA (ft.)

Thickness: NA (ft.)

Immiscible Layer(s) Sampled: Not Applicable

Monitor Well Diameter	Volume/foot of Water	Height of Water Column	Volume of Water Column		
1 (in)	0.041 (gal) x	7.25 (ft)			

Monitoring Well Purging and Sampling Data

Purging Device: Pump

Purging Start Time: 10:00

Purging Stop Time: 10:20

Total Gallons Purged: 1.50

Well Yield: Moderate-Low

Sampling Device: Bailer

Time of Sampling: 10:25

~~**Second Attempt:**~~ ~~am/pm~~

~~**Third Attempt:**~~ ~~am/pm~~

~~**Fourth Attempt:**~~ ~~am/pm~~

~~**Fifth Attempt:**~~ ~~am/pm~~

Flow Rate (mL/min)	Time	Water Level (ft)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity NTU
300	10:00	15.11	16.90	7.07	3.220	Cloudy
240	10:05					Clear
125-150	10:10	14.21	17.50	7.88	3.000	Cloudy
	10:20	13.87				

Sample Container Information

Sample ID	Parameter	Container	Container Size	No. of Containers	Preservative
MW-02	VOC	Amber	VOAs	2	HCl
Dup080213	BTEX/MTBE	Amber	VOAs	2	HCl

Comments

Samples Shipped to: ESC Lab Science **Via:** Matt Danus

Form Completed By: Jamie Berardinelli

Well Sampling Data Log

Well ID

MW-03

Project Information

Project #: C3210006 **Date:** August 2, 2013

Site Name: North Royalton, Vacant Gas Station **Telephone #:**

MSG Personnel Present: JNB, MND

Regulatory Observer(s): None

Weather Conditions: Sunny, Cloudy **Temperature °F:** 63

Field Instrumentation

Static Water Level Measurement: Heron H.01L

Immiscible Layer(s) Measurement: --

Measurement of Field Parameters: Horiba

Peristaltic Pump: Cole Parmer Masterflex E/S

Monitoring Well Data

Ground Surface Elev.:

Top of Casing Elev.:

Ground Water Elev.:

Hydraulic Location:

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: Excellent / none **Well Diameter:** 1 inch

Monitoring Purpose:

Total Depth (from TOC): 27.23 (ft.) - **Static Water Level:** 13.52 (ft.)

= Height of Water Column: 13.71 (ft.)

Immiscible Layer(s) Present: No

Top of Layer: NA (ft.)

Bottom of Layer: NA (ft.)

Thickness: NA (ft.)

Immiscible Layer(s) Sampled: Not Applicable

Monitor Well Diameter	Volume/foot of Water	Height of Water Column	Volume of Water Column		
1 (in)	0.041 (gal) x	13.71 (ft)	= 0.56		
~~2 (in)~~	~~0.163 (gal) x~~	(ft)	=		
~~4 (in)~~	~~0.653 (gal) x~~	(ft)	=		

Monitoring Well Purging and Sampling Data

Purging Device: Pump

Purging Start Time: 9:00

Purging Stop Time: 9:24

Total Gallons Purged: 1.5

Well Yield:

Sampling Device: Bailer

Time of Sampling: 9:25

~~**Second Attempt:**~~ ~~am/pm~~

~~**Third Attempt:**~~ ~~am/pm~~

~~**Fourth Attempt:**~~ ~~am/pm~~

~~**Fifth Attempt:**~~ ~~am/pm~~

Flow Rate (mL/min)	Time	Water Level (ft)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity NTU
240	9:00	15.33	15.40	7.12	3.990	Cloudy
125-150	9:05	14.62				
	9:20	14.57	16.60	7.26	3.900	Clear

Sample Container Information

Sample ID	Parameter	Container	Container Size	No. of Containers	Preservative
MW-03	PAH	Amber	100mL	2	NA
MW-03	VOC	Amber	VOAs	2	HCL

Comments

Samples Shipped to: ESC Lab Science **Via:** Matt Danus

Form Completed By: Jamie Berardinelli

Well Sampling Data Log

Well ID

MW-04

Project Information

Project #: C3210006 **Date:** August 2, 2013

Site Name: North Royalton, Vacant Gas Station **Telephone #:**

MSG Personnel Present: JNB

Regulatory Observer(s): None

Weather Conditions: Sunny **Temperature °F:** 70

Field Instrumentation

Static Water Level Measurement: Heron H.01L

Immiscible Layer(s) Measurement: --

Measurement of Field Parameters: Horiba

Peristaltic Pump: Cole Parmer Masterflex E/S

Monitoring Well Data

Ground Surface Elev.:

Top of Casing Elev.:

Ground Water Elev.:

Hydraulic Location:

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: Excellent / none **Well Diameter:** 1 inch

Monitoring Purpose:

Total Depth (from TOC): 27.25 (ft.) - **Static Water Level:** 12.77 (ft.)

= Height of Water Column: 14.48 (ft.)

Immiscible Layer(s) Present: No

Top of Layer: NA (ft.)

Bottom of Layer: NA (ft.)

Thickness: NA (ft.)

Immiscible Layer(s) Sampled: Not Applicable

Monitor Well Diameter	Volume/foot of Water	Height of Water Column	Volume of Water Column		
1 (in)	0.041 (gal) x	14.48 (ft)	= 0.59		
~~2 (in)~~	~~0.163 (gal) x~~	~~(ft)~~	=		
~~4 (in)~~	~~0.653 (gal) x~~	~~(ft)~~	=		

Monitoring Well Purging and Sampling Data

Purging Device: **Bailer**

Purging Start Time: 12:50

Purging Stop Time: 1:10

Total Gallons Purged: 0.5

Well Yield: Moderate

Sampling Device: Bailer

Time of Sampling: 1:10pm

~~**Second Attempt:**~~ ~~am/pm~~

~~**Third Attempt:**~~ ~~am/pm~~

~~**Fourth Attempt:**~~ ~~am/pm~~

~~**Fifth Attempt:**~~ ~~am/pm~~

Well Volumes	Time	Vol. Purged (gal)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity NTU
Start	12:50		18.20	7.46	3.510	Cloudy
	1:00		15.70	7.29	3.700	Clear

Sample Container Information

Sample ID	Parameter	Container	Container Size	No. of Containers	Preservative
MW-04	BTEX/MTBE	Amber	VOAs	2	HCL

Comments

Used Bailer as purging device, pump wouldn't pump water from well.

Samples Shipped to: ESC Lab Science **Via:** Matt Danus

Form Completed By: Jamie Berardinelli

Well Sampling Data Log

Well ID
MW-05

Project Information

Project #: C3210006 **Date:** August 2, 2013
Site Name: North Royalton, Vacant Gas Station **Telephone #:**
MSG Personnel Present: JNB
Regulatory Observer(s): None
Weather Conditions: Sunny **Temperature °F:** 70

Field Instrumentation

Static Water Level Measurement: Heron H.01L
Immiscible Layer(s) Measurement: --
Measurement of Field Parameters: Horiba
Peristaltic Pump: cole palmer

Monitoring Well Data

Ground Surface Elev.: 596.59
Top of Casing Elev.: 596.20
Ground Water Elev.: 581.64
Hydraulic Location: NA

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: Excellent / none **Well Diameter:** 1 inch
Monitoring Purpose:
Total Depth (from TOC): 26.73 (ft.) - **Static Water Level:** 14.56 (ft.)
= Height of Water Column: 12.17 (ft.)
Immiscible Layer(s) Present: No
Top of Layer: NA (ft.)
Bottom of Layer: NA (ft.)
Thickness: NA (ft.)
Immiscible Layer(s) Sampled: Not Applicable

Monitor Well Diameter	Volume/foot of Water	Height of Water Column	Volume of Water Column		
1 (in)	0.041	12.17 (ft)	= 1.98		
2 (in)	0.163 (gal) x	(ft)	=		

Monitoring Well Purging and Sampling Data

Purging Device: Bailer
Purging Start Time: 12:10
Purging Stop Time: 12:40
Total Gallons Purged: 1.00
Well Yield:
Sampling Device: Bailer
Time of Sampling: 10:00
~~**Second Attempt:**~~ ~~am/pm~~
~~**Third Attempt:**~~ ~~am/pm~~
~~**Fourth Attempt:**~~ ~~am/pm~~
~~**Fifth Attempt:**~~ ~~am/pm~~

Well Volumes	Time	Vol. Purged (gal)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity NTU
Start	12:10		19.80	7.72	3.700	Cloudy
2	12:05		18.50	7.46	3.740	Cloudy
Final	12:20		16.40	7.34	3.740	Cloudy

Sample Container Information

Sample ID	Parameter	Container	Container Size	No. of Containers	Preservative
MW-05	PAH	Amber	100mL	2	NA
MW-05	VOC	Amber	VOAs	2	HCL

Comments

Used Bailer as purging device, pump wouldn't pump water from well.

Samples Shipped to: ESC Lab Science **Via:** Matt Danus
Form Completed By: Jamie Berardinelli

Well Sampling Data Log

Well ID
MW-06

Project Information

Project #: C3210006 **Date:** August 2, 2013
Site Name: North Royalton, Vacant Gas Station **Telephone #:**
MSG Personnel Present: JNB
Regulatory Observer(s): None
Weather Conditions: Sunny **Temperature °F:** 70

Field Instrumentation

Static Water Level Measurement: Heron H.01L
Immiscible Layer(s) Measurement: --
Measurement of Field Parameters: Horiba
Peristaltic Pump: Cole Parmer Masterflex E/S

Monitoring Well Data

Ground Surface Elev.:
Top of Casing Elev.:
Ground Water Elev.:
Hydraulic Location:

Additional Monitoring Well Data

Well Condition/Evidence of Tampering: Excellent / none **Well Diameter:** 1 inch
Monitoring Purpose:
Total Depth (from TOC): 31.13 (ft.) - **Static Water Level:** 15.20 (ft.)
= Height of Water Column: 15.93 (ft.)
Immiscible Layer(s) Present: No
Top of Layer: NA (ft.)
Bottom of Layer: NA (ft.)
Thickness: NA (ft.)
Immiscible Layer(s) Sampled: Not Applicable

Monitor Well Diameter	Volume/foot of Water	Height of Water Column	Volume of Water Column		
1 (in)	0.041 (gal) x	15.93 (ft)	= 0.65		
~~2 (in)~~	~~0.163 (gal) x~~	~~(ft)~~	=		
~~4 (in)~~	~~0.653 (gal) x~~	~~(ft)~~	=		

Monitoring Well Purging and Sampling Data

Purging Device: pump
Purging Start Time: 11:14am
Purging Stop Time: 11:32
Total Gallons Purged: 1.0
Well Yield:
Sampling Device: Bailer
Time of Sampling: 11:32
~~**Second Attempt:**~~ ~~am/pm~~
~~**Third Attempt:**~~ ~~am/pm~~
~~**Fourth Attempt:**~~ ~~am/pm~~
~~**Fifth Attempt:**~~ ~~am/pm~~

Flow Rate (mL/min)	Time	Water Lever (ft)	Temperature (°C)	pH (S.U.)	Conductivity (mS/cm)	Turbidity NTU
240	11:15	15.20	23.00	7.21	3.120	Clear
125-150	11:25	18.37	21.40	7.28	3.010	Clear
	11:32	18.31				

Sample Container Information

Sample ID	Parameter	Container	Container Size	No. of Containers	Preservative
MW-06	VOC	Amber	VOAs	2	HCL

Comments

Samples Shipped to: ESC Lab Science **Via:** Matt Danus
Form Completed By: Jamie Berardinelli